



# NATIONAL DEFENSE STOCKPILE

## Actions Needed to Improve DOD's Efforts to Prepare for Emergencies

Report to the Committee on Armed Services, House of  
Representatives

September 2024  
GAO-24-106959  
United States Government Accountability Office

Accessible Version

# GAO Highlights

View [GAO-24-106959](#). For more information, contact W. William Russell at (202) 512-4841 or [RussellW@gao.gov](mailto:RussellW@gao.gov).  
Highlights of [GAO-24-106959](#), a report to the Committee on Armed Services, House of Representatives

September 2024

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#### Why GAO Did This Study

The Strategic and Critical Materials Stock Piling Act established the National Defense Stockpile to hold materials essential to defense and civilian needs. One such material is titanium, which is a strong, light-weight metal that helps prevent corrosion in weapon systems.

A House report includes a provision for GAO to assess DOD efforts to stockpile strategic and critical materials. This report examines the extent to which DOD (1) established processes for identifying requirements and managing the stockpile, (2) reported to Congress on changes and risks to the stockpile, and (3) is reliant on foreign and single domestic sources of supply.

GAO analyzed DOD's process for developing stockpile requirements, its three most recent biennial stockpile reports (fiscal years 2019 through 2023), and other related documents. GAO also interviewed officials from several entities such as the Defense Logistics Agency, as well as the Institute for Defense Analyses.

#### What GAO Recommends

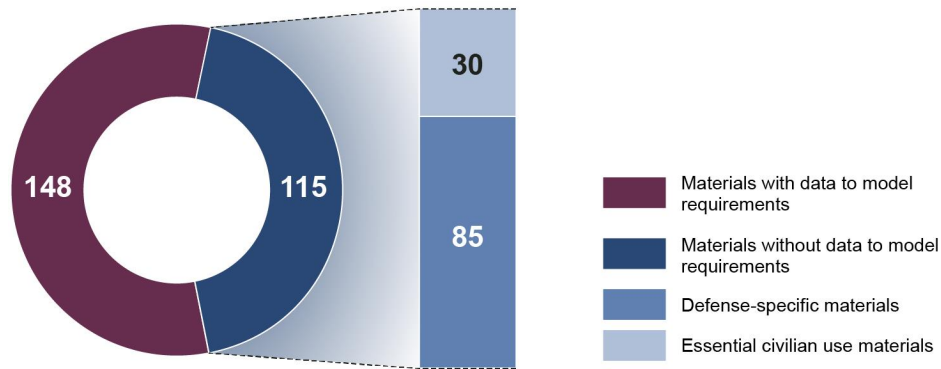
GAO is making six recommendations, including that DOD identify: roles and responsibilities for providing data needed to model DOD's requirements for all critical materials and report all shortfalls, the risks associated with unmodeled materials, and the status of previous stockpiling recommendations.

DOD concurred with all six of these recommendations.

#### What GAO Found

The Department of Defense (DOD) maintains the National Defense Stockpile to store materials that are strategic and critical to defense and essential civilian needs in times of national emergency. DOD has processes for identifying material requirements and managing the stockpile, but some aspects are not fully defined. For example, DOD does not require relevant entities, such as program offices, to provide the necessary data to model requirements for over 40 percent of its strategic and critical materials. Without data to model more requirements, DOD risks not having stock of its highest priority materials.

## Data Available to Model DOD's Strategic and Critical Material Requirements, Fiscal Year 2023



Source: GAO analysis of Department of Defense (DOD) information. | GAO-24-106959

## Accessible Data for Data Available to Model DOD's Strategic and Critical Material Requirements, Fiscal Year 2023

- Materials with data to model (148)
- Materials without data to model (115)
  - 30 civilian use materials (30)
  - 85 defense-specific materials (85)

Source: GAO analysis of Department of Defense (DOD) information. | GAO-24-106959

DOD's biennial stockpile reports to Congress included details on stockpile inventory and material shortfalls, but did not include information on all risks and prior actions taken to address them. DOD's reports indicate that from fiscal years 2019 to 2023, DOD primarily stockpiled the same 50 types of materials, but the number of materials in shortfall increased by 167 percent, from 37 to 99. The reports included some information about risks, such as the type of products affected, and recommended actions to address the shortfall. However, in the fiscal year 2023 report, DOD either did not have or chose not to include all information needed for congressional and DOD decision-making, such as

- a list of all materials in shortfall, rather than just those deemed priorities,
- the risk associated with materials it could not model, such as affected weapon systems, or
- the status of DOD efforts to implement recommendations from its prior reports.

Over 90 percent of the materials DOD identified in shortfall in fiscal year 2023 had either zero or one domestic supplier. In addition to stockpiling, DOD is mitigating some of the risks of relying on foreign or a single domestic source of supply by recycling materials from no-longer-used equipment, qualifying new domestic sources, and funding research and development projects to identify new ways to process critical materials. Even with these efforts, DOD estimates it will need \$18.5 billion to address all shortfalls identified in fiscal year 2023.

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**Abbreviations**

DLA	Defense Logistics Agency
DOD	Department of Defense
IDA	Institute for Defense Analyses



September 10, 2024

The Honorable Mike Rogers  
Chairman  
The Honorable Adam Smith  
Ranking Member  
Committee on Armed Services  
House of Representatives

Each year, the Department of Defense (DOD) spends billions of dollars to ensure that it can meet U.S. national security objectives and maintain military superiority. In the case of a national emergency, however, U.S. access to materials needed to achieve these goals, particularly those that rely on a single domestic or foreign source of supply, may be at risk. As part of efforts to ensure that DOD and U.S. manufacturers have access to critical materials in case of a national emergency, Congress passed the Strategic and Critical Materials Stock Piling Act in 1939.<sup>1</sup> Among other things, the act requires the establishment of a National Defense Stockpile to acquire and retain materials it determines are critical to meet military and essential civilian needs. Critical materials include metals like titanium, which is a strong, light-weight material that helps prevent weapon system corrosion, and lithium, which is used in battery production supporting many applications, including electric vehicles.<sup>2</sup>

Over the past several years, the Executive Branch and Congress have continued to take actions to help ensure U.S. access to strategic and critical materials. In February 2021, partially in response to the COVID-19 pandemic, the President issued an executive order calling for the strengthening of America’s supply chains.<sup>3</sup> In response, DOD has reported obligating over \$893 million as of November 2023 for investments in five key areas identified in the order, including strategic and critical materials. In addition, Congress passed the National Defense Authorization Act for Fiscal Year 2024 requiring DOD to develop a strategy by 2035 that ensures its supply chains do not rely on certain countries like China or Russia for critical minerals.

The House report accompanying the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 included a provision for GAO to review DOD’s national defense stockpiling efforts.<sup>4</sup> This report examines (1) the extent to which DOD has established processes for determining material requirements and managing its stockpile of strategic and critical materials, (2) the extent to which DOD reported to Congress on changes to its strategic and critical materials stockpile from fiscal years 2019 through 2023 and remaining risks associated

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<sup>1</sup>Act of June 7, 1939, Pub. L. No. 76-117, ch.190 (codified as amended at 50 U.S.C. §§ 98–100a). The name “Strategic and Critical Materials Stock Piling Act” was added in a 1946 amendment to the original 1939 law. Strategic and Critical Materials Stock Piling Act, Pub. L. No. 79-520 (1946). For the purposes of this report, we refer to the National Defense Stockpile as “the stockpile.”

<sup>2</sup>We previously reported on the Department of Energy’s efforts to secure critical minerals. See GAO, *Critical Minerals: Building on Federal Efforts to Advance Recovery and Substitution Could Help Address Supply Risks*, [GAO-22-104824](#) (Washington, D.C.: June 16, 2022); and *Nuclear Weapons: NNSA Plans to Modernize Critical Depleted Uranium Capabilities and Improve Program Management*, [GAO-21-16](#) (Washington, D.C.: Oct. 15, 2020).

<sup>3</sup>Exec. Order No. 14017, 86 Fed. Reg. 11,849 (Feb. 24, 2021).

<sup>4</sup>H.R. Rep. No. 117-397 (2022).

with these materials, and (3) DOD's reliance on foreign and single domestic sources of supply to address shortfalls.

To assess DOD's processes for determining material requirements and managing its stockpile of strategic and critical materials, we analyzed relevant DOD and Institute for Defense Analyses (IDA) documents on the process for analyzing strategic and critical material requirements.<sup>5</sup> We also interviewed officials from the Defense Logistics Agency (DLA) and IDA responsible for doing so.<sup>6</sup> Further, we reviewed DOD's processes and available guidance for acquiring, storing, and withdrawing materials from the stockpile. We then compared DOD's processes to relevant legislative requirements, our *Assessment Methodology for Economic Analysis, and our Standards for Internal Control in the Federal Government*.<sup>7</sup>

To assess DOD's reporting on changes to its stockpile of strategic and critical materials and remaining risks, we analyzed the fiscal years 2019, 2021, and 2023 biennial reports to Congress on stockpile requirements and associated materials. We also reviewed documents related to the procurement or sale of stockpiled materials across this time to identify changes in materials held and those DOD has determined it would not have enough access to during a national emergency, referred to as a shortfall.<sup>8</sup>

To understand DOD's reliance on foreign and single domestic sources for strategic and critical materials, we reviewed DOD stockpile reports and DOD analyses used to develop the biennial stockpile requirements reports to determine sources for stockpiled materials, including those in shortfall. We also interviewed DLA officials to discuss steps taken to minimize risk. A more detailed description of our scope and methodology is included in appendix I.

We conducted this performance audit from July 2023 to September 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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## Background

The U.S. defense industrial base includes a combination of people, technology, institutions, technological know-how, and facilities used to design, develop, manufacture, and maintain the weapons needed to meet U.S. national security objectives. In November 2023, DOD published its first National Defense Industrial Strategy, noting that a robust and resilient industrial base provides the enduring foundation for military

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<sup>5</sup>IDA is a private, nonprofit corporation that provides analysis for U.S. government agencies like DOD and the Departments of Commerce, Energy, and Homeland Security.

<sup>6</sup>DLA is a combat logistics support agency that manages the global defense supply chain for the military services and combatant commands.

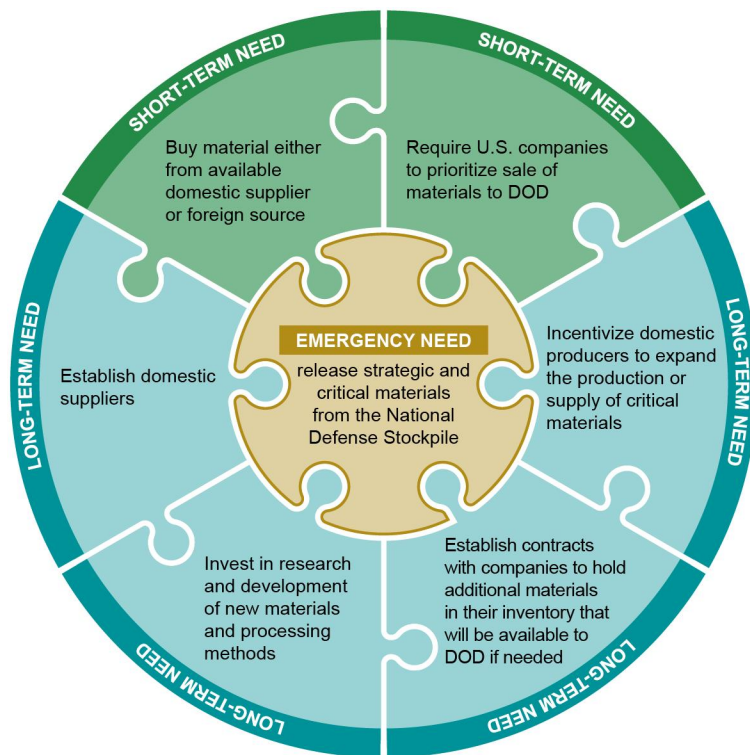
<sup>7</sup>GAO, *Assessment Methodology for Economic Analysis*, [GAO-18-151SP](#) (Washington, D.C.: April 2018); and *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

<sup>8</sup>DOD, *Summary of the Strategic and Critical Materials 2019 Biennial Report on Stockpile Requirements* (Jan. 10, 2019); *Strategic and Critical Materials 2021 Report on Stockpile Requirements* (February 2021); and *Strategic and Critical Materials 2023 Biennial Report on Stockpile Requirements* (April 2023).

advantage.<sup>9</sup> Risks to the industrial base—any event or condition that may disrupt or degrade DOD supplier capabilities or capacity needed to equip or sustain military forces now and in the future—are seen as threats to U.S. national security. One such risk is that DOD will not be able to access strategic and critical materials essential to manufacturing weapon systems when needed.

To ensure access, DOD has several tools at its disposal to meet short-term, long-term, or emergency requirements for the materials. See figure 1 for examples.

**Figure 1: Examples of Actions DOD Takes to Ensure Access to Strategic and Critical Materials**



Source: GAO analysis of Department of Defense (DOD) documentation. | GAO-24-106959

Defense Production Act authorities, as delegated by the President, are key tools DOD can use to address some short- and long-term material needs.<sup>10</sup> DOD can use title I authorities in the act to, among other things, place priority ratings on contracts so that its orders will get preference over others, such as private sector manufacturers. Additionally, using title III authorities, DOD can, for example, provide financial incentives to companies to meet national defense goals, such as expanding domestic production of strategic and critical

<sup>9</sup>DOD, *National Defense Industrial Strategy* (2023). The strategy highlights DOD’s priorities in the area and provides actions the department should take achieve resilient supply chains, workforce readiness, flexible acquisition, and economic deterrence.

<sup>10</sup>The Defense Production Act of 1950, Pub. L. No. 81-774 (codified as amended at 50 U.S.C. §§ 4501-4568). During the Korean War, the Defense Production Act of 1950 was enacted to ensure the availability of industrial resources to meet DOD’s needs. The act facilitates the supply and timely delivery of products, materials, and services to military and civilian agencies in times of peace as well as in times of war.

materials so that the U.S. will be less dependent on foreign sources of supply. According to USASpending.gov, as of February 2024, DOD had over \$1 billion available to spend on Defense Production Act purchases.<sup>11</sup>

Stockpiling is another key tool but differs from other DOD efforts to secure the strategic and critical materials industrial base. Stockpiling focuses on buying and holding materials for a long period of time rather than identifying consistent sources for materials. Specifically, through the National Defense Stockpile, DOD aims to mitigate potential supply chain disruptions during an emergency, such as those caused by military conflict against one or more adversary countries or an attack on the homeland.

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## Overview of the National Defense Stockpile

The National Defense Stockpile is intended to guard against military and essential civilian-sector production shortfalls caused by limited access to materials in times of national emergency. It was established by the Strategic and Critical Materials Stock Piling Act of 1939, which has been periodically amended since its passage, including through National Defense Authorization Acts.<sup>12</sup> For example, the National Defense Authorization Act for Fiscal Year 2013 expanded the purpose of the stockpile to include reducing risks associated with a single domestic producer in addition to foreign sources.<sup>13</sup> More recently, in 2022, the Strategic and Critical Materials Stock Piling Act was amended to require DOD to brief the congressional defense committees annually on material shortfalls, to include a description of the materials and the amount of funding needed to address the shortfall.<sup>14</sup>

DLA stores strategic and critical materials, such as zinc and cobalt, at five locations across the country, as depicted in figure 2.

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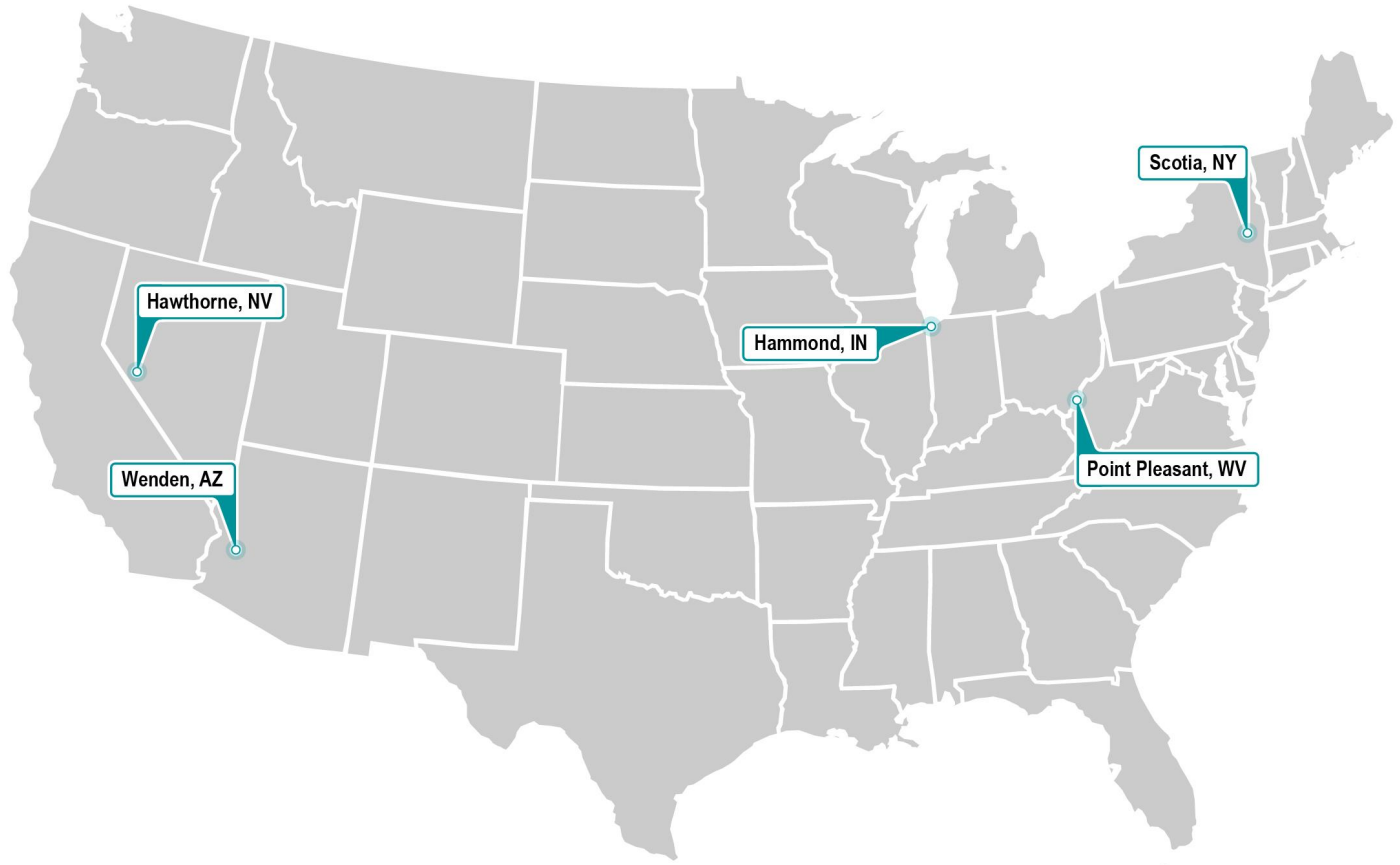
<sup>11</sup>The Defense Production Act is not limited to acquiring critical materials. For example, we previously reported on federal agencies', including DOD's, use of Defense Production Act funds to respond to the COVID-19 pandemic. See GAO, *COVID-19: Agencies Are Taking Steps to Improve Future Use of Defense Production Act Authorities*, [GAO-22-105380](#) (Washington, D.C.: Dec. 16, 2021). USASpending.gov is the official source of federal spending information. It includes information about federal awards such as contracts, grants, and loans. It is intended to inform the American public about how much the federal government spends every year and for what purposes.

<sup>12</sup>Act of June 7, 1939, Pub. L. No. 76-117, ch. 190 (codified as amended at 50 U.S.C. §§ 98–100a).

<sup>13</sup>National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239, § 1412 (amending Section 2(b) of the Strategic and Critical Materials Stock Piling Act by "inserting 'or a single point of failure' after 'foreign sources'").

<sup>14</sup>James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, § 1413 (2022).

Figure 2: Locations of National Defense Stockpile Materials



Source: Defense Logistics Agency documentation. | GAO-24-106959

Stockpile activities are funded through the National Defense Stockpile Transaction Fund, which is a revolving fund that receives money from both the sale of excess inventory and appropriations.<sup>15</sup> Funds received from the sale of excess inventory, according to DLA officials, has recently only been sufficient to cover the administrative costs associated with running the stockpile. Congress appropriated \$218.5 million for stockpile activities from fiscal years 2019 to 2023 for DOD to acquire materials required to meet the defense, industrial, and essential civilian needs of the U.S.<sup>16</sup>

<sup>15</sup>The Strategic and Critical Materials Stock Piling Revision Act of 1979, Pub. L. No. 96-41 (codified as amended at 50 U.S.C. §§ 98–100a) established the National Defense Stockpile Transaction Fund. The fund may be used for enumerated purposes related to the stockpile, including, for example, the acquisition, maintenance, and disposal of strategic and critical materials.

<sup>16</sup>Congress did not appropriate funds for stockpile activities in fiscal years 2019, 2020, or 2021, but appropriated \$125 million in fiscal year 2022 and \$93.5 million in fiscal year 2023.



## Entities Responsible for the National Defense Stockpile

Executive Order 12626, issued in February 1988, designated the Secretary of Defense as the stockpile manager. The Secretary delegated responsibilities to the Under Secretary of Defense for Acquisition and Sustainment, who further transferred the day-to-day responsibilities to DLA.<sup>17</sup> DLA, specifically its Strategic Materials office, is responsible for identifying strategic and critical material stockpile needs and managing the materials.<sup>18</sup> Figure 3 provides an overview of these responsibilities.

**Figure 3: Overview of Defense Logistics Agency Responsibilities for the National Defense Stockpile**



Source: GAO analysis of Department of Defense (DOD) documentation. | GAO-24-106959

Every other fiscal year, DLA prepares the Strategic and Critical Materials Report on Stockpile Requirements, which the Under Secretary of Defense for Acquisition and Sustainment then approves and submits to Congress. The report details materials that DOD and U.S. companies producing essential civilian or defense goods and services will need to recover from a specified national emergency, as well as recommended actions DOD should take to address any shortfalls.<sup>19</sup> The most recent report was provided to Congress in May 2023.<sup>20</sup> DOD uses this information to guide its material acquisitions and sales related to the stockpile, which it details in its Annual Operations and Planning Report to Congress.<sup>21</sup>

DOD has been working with IDA since 1988 to determine the type and quantity of materials that are needed in case of a national emergency. IDA is responsible for developing and maintaining the models used to identify strategic and critical material requirements. IDA and DLA officials told us that they discuss improvements and

<sup>17</sup>DOD Directive 5134.01, issued in 2005, delegated the authority of the stockpile manager to the Under Secretary of Defense for Acquisition, Technology, and Logistics. DOD Directive 5105.22, issued in 2006, placed the operational oversight of the stockpile with the Director, DLA. Following a reorganization, DOD Directive 5135.02 delegated the exercise of the authority of stockpile manager to the Under Secretary of Defense for Acquisition and Sustainment in 2020.

<sup>18</sup>In addition to its responsibilities to identify and manage strategic and critical materials, DLA is expected to play a key role in future efforts to stockpile critical minerals. Specifically, in February 2022, DOD, the Department of Energy, and the Department of State signed a memorandum of agreement that sets the foundation for a critical minerals stockpile to support the U.S. transition to clean energy and national security needs.

<sup>19</sup>The specified national emergency—referred to in this report as the predefined conflict scenario—refers to an overall national emergency that includes a conflict period followed by a regeneration and rebuilding period. The conflict scenario aligns with information presented in DOD’s 2018 National Defense Strategy. It includes a military conflict and homeland damage resulting from a hostile attack, and a climate change event.

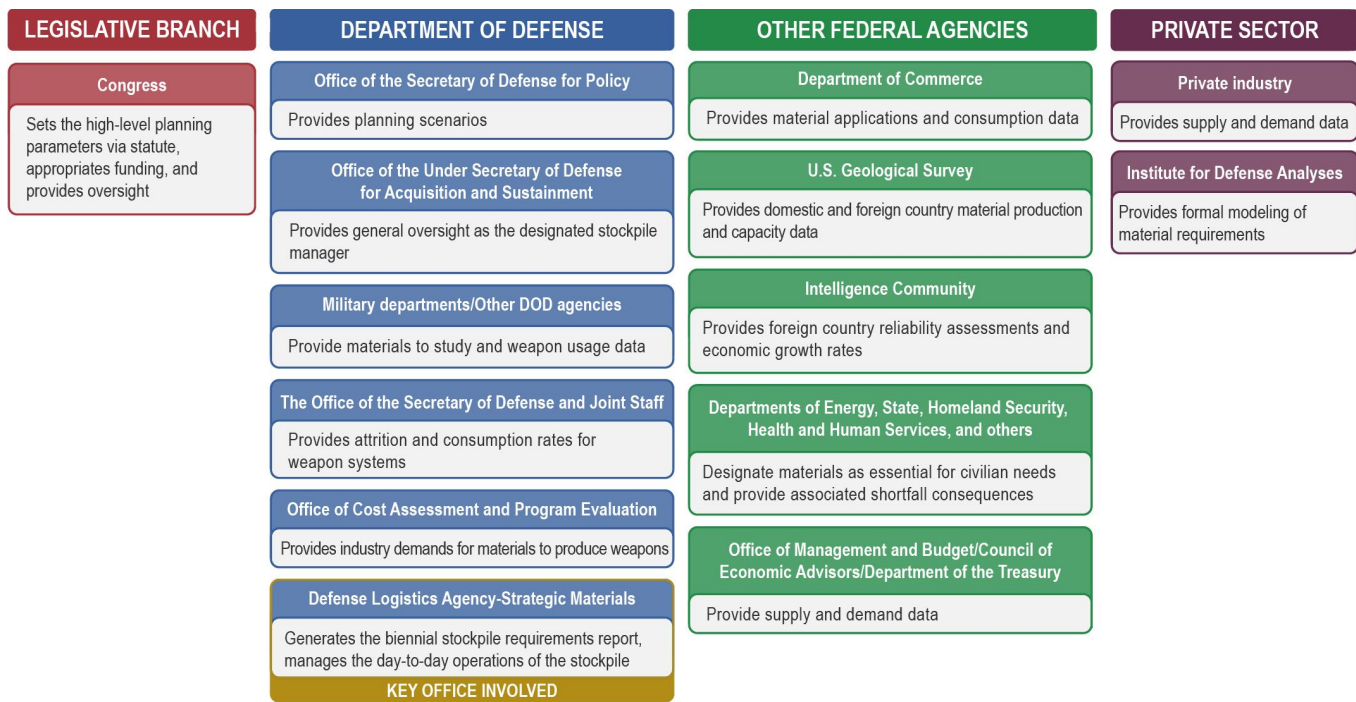
<sup>20</sup>DOD, *Strategic and Critical Materials 2023 Biennial Report on Stockpile Requirements* (April 2023).

<sup>21</sup>DOD’s national defense stockpile operations and planning reports include information on recent and planned material acquisitions, sales, and disposals. Additionally, the reports provide details on the financial status of the National Defense Stockpile Transaction Fund.

make changes to the modeling process when necessary for each report cycle. For example, IDA proposed and DLA accepted a new methodology for determining essential civilian demand, which influenced the stockpile requirements reflected in DOD’s reports to Congress beginning in fiscal year 2019. Additionally, for the 2023 requirements report, IDA introduced a new approach that helps DOD prioritize which materials to acquire.

Aside from IDA and DLA, numerous entities within DOD, across the federal government, and in the private sector contribute information necessary to determine stockpile requirements. For example, the military services provide the names of materials that DLA should study and entities such as the Department of Commerce, U.S. Geological Survey, and private companies provide supply and demand data for these materials. Figure 4 provides an overview of those involved.

**Figure 4: Entities Involved with the National Defense Stockpile**



Source: GAO representation of Department of Defense (DOD) and Institute for Defense Analyses documentation. | GAO-24-106959

The James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 established the Strategic and Critical Materials Board of Directors.<sup>22</sup> The board is to be composed of the Assistant Secretary of Defense for Industrial Base Policy (who also serves as the board’s chairperson), designees from other federal agencies like the Departments of Commerce and State, designees from the congressional armed services committees, and four other subject matter experts designated by the chairperson. Its assigned duties include establishing performance metrics, conducting annual performance reviews of DLA’s management of the stockpile, and recommending a strategy to secure the supply of critical materials. DOD officials stated that DOD is in the

<sup>22</sup>James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263, § 1411 (2022).



process of identifying the appropriate board members and they expect this to be done by the end of calendar year 2024.

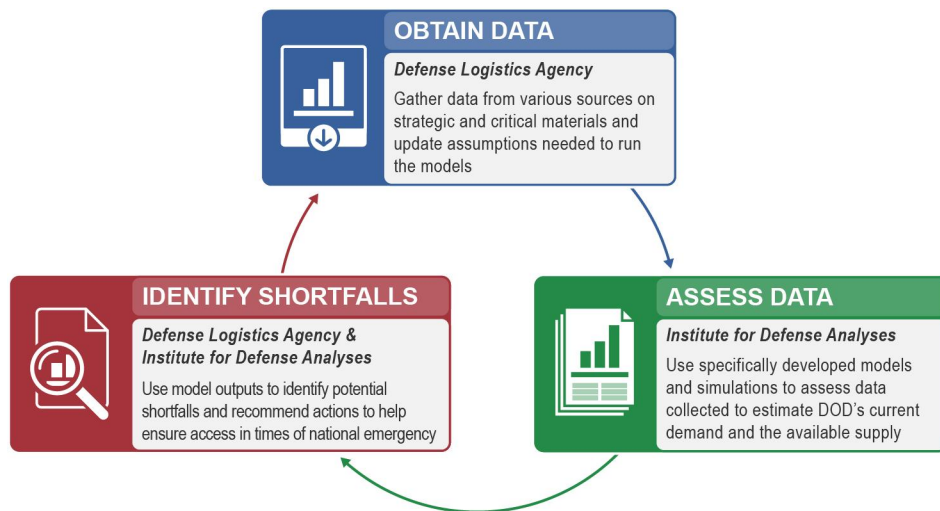
## DOD Has Not Fully Defined Processes for Determining Stockpile Requirements and Releasing Materials

DOD has developed a process for identifying material requirements to determine shortfalls, but it does not have the appropriate data to model requirements for 115, or over 40 percent, of the strategic and critical materials it wanted to model in fiscal year 2023. Further, while DLA recommends actions that DOD should take to address the shortfalls it is able to identify, DLA officials acknowledged that their approach for making these recommendations is not documented. Additionally, DOD has established guidance for some aspects of managing the stockpile, like acquiring and selling materials. However, DOD has not yet finalized criteria clarifying the circumstances under which materials should be released for use.

## DOD Does Not Have Data Needed to Model Requirements for Over 40 Percent of Its Critical Materials

DOD has developed a process for identifying strategic and critical material requirements. However, DOD did not have the data needed to do so for 115 of the 263 materials—or about 44 percent—it wanted to model in fiscal year 2023.<sup>23</sup> Figure 5 provides an overview of the three broad steps in DOD's process.

Figure 5: Overview of DOD's Process for Identifying Strategic and Critical Material Requirements



Source: GAO analysis of Department of Defense (DOD) documentation. | GAO-24-106959

To start the requirements determination process, DOD obtains supply and demand data for the strategic and critical materials it considers at risk and updates model assumptions where necessary. These data include

<sup>23</sup>In general, DOD attempts to model materials that it believes pose a risk of it being unable to obtain during a national emergency.

production, capacity, import, export, and other data from various sources, such as the Department of Commerce and the U.S. Geological Survey. According to DLA officials, DOD relies on the willingness of DOD program offices and private industry partners to provide the equivalent data for materials not included in the Department of Commerce or U.S. Geological Survey's data sets. The majority of these materials are specific to defense needs.

DOD consistently used 68 broad assumptions to identify material requirements for its fiscal year 2019, 2021, and 2023 reports. These assumptions span 15 general areas related to weapon systems, imports, exports, and the global economic market, among others. Within these areas, DOD considers factors such as the expected willingness of a foreign country to provide a material and the expected time needed to receive a material in a national emergency.

According to DLA officials, the broad assumptions are set and are not changed unless the predefined conflict scenario changes, but DOD modifies the details associated with these assumptions based on real world data when possible. For example, to update the willingness of a foreign country to provide a material, DLA officials told us they rely on recent assessments from the intelligence community. In another example, DLA officials told us that foreign suppliers are currently able to pivot more quickly than was seen during the height of the COVID-19 pandemic. Therefore, DLA plans to reduce the expected time needed to obtain a material when determining requirements for the fiscal year 2025 requirements report.

From there, DOD provides the data and assumptions to IDA to assess. To do so, IDA uses a series of internally developed models that calculate the overall U.S. demand for materials and the available supply, which are then used to identify materials in shortfall.<sup>24</sup> We found that the modeling process that DLA and IDA use to determine supply and demand and calculate shortfalls generally aligns with our key practices for economic analysis.<sup>25</sup> For example, IDA has described the details of its models, including its methodology for using them, in over 10 publications.<sup>26</sup> Additionally, DLA and IDA collaborate on any changes to the assumptions or data from one report cycle to the next, and IDA officials told us that they hold a meeting following each requirements report cycle to discuss any limitations. DOD accredited the modeling process in accordance with DOD policy.<sup>27</sup>

Lastly, DOD and IDA compare the projected material demand to available supply and consider the availability of any mitigating actions to identify material shortfalls. For example, before classifying a material as a shortfall, DOD and IDA consider whether that material could be substituted for another, more readily available material in an emergency.

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<sup>24</sup>The series of models is collectively known as the Risk Assessment and Mitigation Framework for Strategic Materials.

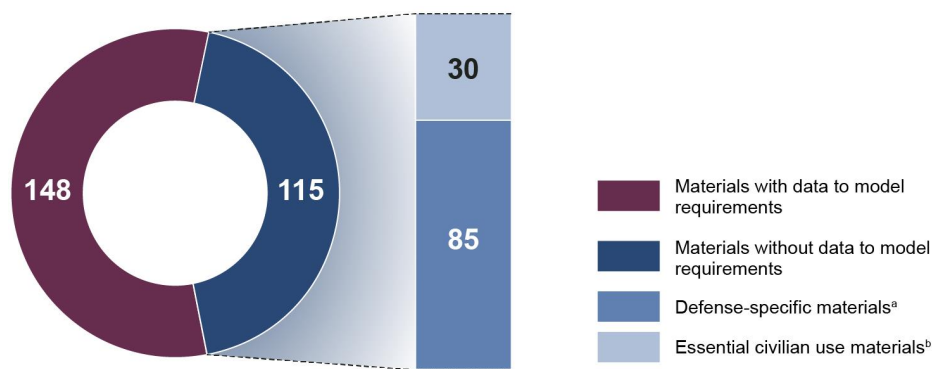
<sup>25</sup>[GAO-18-151SP](#). Our assessment methodology for economic analysis includes key practices such as a description of the objective and scope of the analysis as well as comparing alternatives. Full details on our key practices can be found in appendix I.

<sup>26</sup>Examples of IDA publications include: James S. Thomason et al., Institute for Defense Analyses, *Computation of Material Demand in the Risk Assessment and Mitigation Framework for Strategic Materials (RAMF-SM) Process* (August 2015); *Forces Mobilization Model (FORCEMOB): Unclassified Training Tutorial* (August 2015); and *Weapon-Specific Strategic Material Estimation Process (WSSMEP)* (December 2014).

<sup>27</sup>Department of Defense, *DoD Modeling and Simulation (M&S) Verification, Validation, and Accreditation (VV&A)*, DOD Instruction 5000.61 (incorporating change 1, Oct. 15, 2018).

While DOD has a process to identify shortfalls in strategic or critical materials, it is unable to determine material requirements for 115 materials because. According to DLA officials, this is because DOD does not have access to adequate supply and demand data needed to run the models, such as global production and consumption data. The majority of these unmodeled materials—74 percent—are those that DOD has deemed specific for defense needs. One example is Kevlar®, which is a strong fiber used by DOD in ballistic body armor. The remaining 26 percent of materials are those needed for essential civilian use such as titanium metal, which is used to manufacture commercial aircraft. Figure 6 provides a breakdown of the materials for which DOD could not model requirements in fiscal year 2023.

**Figure 6: Data Available to Model DOD’s Strategic and Critical Material Requirements, Fiscal Year 2023**



Source: GAO analysis of Department of Defense (DOD) information. | GAO-24-106959

**Accessible Data for Figure 6: Data Available to Model DOD’s Strategic and Critical Material Requirements, Fiscal Year 2023**

- Materials with data to model (148)
- Materials without data to model (115)
  - 30 civilian use materials (30)
  - 85 defense-specific materials (85)

Source: GAO analysis of Department of Defense (DOD) information. | GAO-24-106959

Note: As of March 2024, DOD’s list of strategic and critical materials for which a shortfall would pose a risk to national security contained 258 materials. In fiscal year 2023, DOD modeled 143 of these materials as well as five additional materials for which it determined that a shortfall in would not pose a risk to national security.

<sup>a</sup>Materials needed by U.S. manufacturers to produce defense-specific goods and services, such as weapon systems and munitions lost in conflict.

<sup>b</sup>Materials needed by U.S. manufacturers to produce civilian-sector goods and services considered essential, such as commercial aircraft or components supporting the national electrical grid.

According to DLA officials, DLA’s goal is to model all the materials that currently pose a risk, but collecting the information needed is difficult and time-consuming. DLA officials told us that it began distributing a biennial survey across the DOD enterprise in fiscal year 2013 to solicit information on defense-specific materials and other suggested changes to the list of materials monitored. However, it stopped sending out surveys when its December 2019 survey achieved a 1 percent response rate.

Although DLA relies on entities across DOD, such as program offices and military laboratories, for input on strategic and critical materials, DOD does not require entities to regularly provide DLA with supply and demand information needed to inform the biennial stockpile requirements reports to Congress. According to DLA

officials, DOD program offices and their industry partners are often unable or unwilling to provide the information needed for a variety of reasons. For example, DLA officials said that defense contractors may be unable to provide information to DOD program offices because they do not always know where a material is sourced. Additionally, if they do know, they may be unwilling to share this information for fear of losing their source to another company. DLA officials also said that program offices sometimes do not know who is responsible for responding to data requests from DLA to identify materials that should be monitored or have the level of detailed information needed to determine requirements.

DOD's 2023 National Defense Industrial Strategy states that DOD will expand its approach to stockpiling to mitigate vulnerabilities in the supply chain.<sup>28</sup> In order to expand its ability to understand stockpile requirements, DLA must rely heavily on other DOD organizations, like program offices and the military laboratories, to identify materials to monitor and provide the information needed to determine their requirements. However, DOD's lack of clear roles and responsibilities—such as the military departments not knowing which officials are responsible for responding to the data requests—have hindered DLA's efforts.

Additionally, *Standards for Internal Controls in the Federal Government* highlights the importance of maintaining documentation that establishes and communicates roles and responsibilities.<sup>29</sup> Without clearly identifying relevant entities and defining responsibilities for regularly providing information on strategic and critical materials, DOD may continue to face difficulties collecting the information needed to determine materiel requirements, and risks not having stock of its highest priority materials.

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## Process for Making Recommendations that Address Material Shortfalls Is Not Documented

DLA recommends actions that DOD should take to address identified shortfalls in materials, but does not document the process it uses to make these recommendations. DLA has made over 100 recommendations to address material shortfalls identified through the modeling process across the fiscal year 2019, 2021, and 2023 requirement reports. These recommendations are primarily to either stockpile the material, to establish a domestic source, or to study the material further to better understand the supply chain before deciding on an action.

According to DLA officials, DLA's three full-time economists are responsible for determining the appropriate recommendation for all materials in shortfall. DLA officials told us they consider criteria like DOD's long-term needs as well as the shelf life and storage characteristics of the material. Additionally, according to DLA officials, they regularly seek input from a variety of subject matter experts in DLA such as materials engineers, scientists, and market analysts when deciding on a recommendation. While DLA officials told us their process includes steps like reviewing past recommendations and soliciting input from other subject matter experts, DLA has not formally documented this process in guidance, job aids, or other means.

DLA officials added that they have recently experienced staff turnover and are in the process of hiring two additional economists. According to DLA officials, they plan to train the new economists largely through shadowing and mentoring. For example, they told us that they plan to connect the new economists with the

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<sup>28</sup>DOD, *National Defense Industrial Strategy* (2023).

<sup>29</sup>[GAO-14-704G](#).

relevant personnel at IDA who have been working with DLA since the 1980s to understand the modeling process. Additionally, the new economists will be able to review examples of information collected for previous biennial requirement reports and past recommendations.

Standards for *Internal Control in the Federal Government* states that agencies should establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives.<sup>30</sup> This includes maintaining effective documentation on roles, responsibilities, and processes. According to these standards, agencies benefit from a documented process to retain organizational knowledge and mitigate the risk of having that knowledge limited to a few personnel.

DLA officials told us they have not documented the process for determining the appropriate actions to respond to material shortfalls because they routinely use the same process for making decisions. While DLA economists currently have extensive knowledge and expertise, documenting the process used to make recommendations, such as in guidance or job aids, can help ensure that new staff have the resources needed to perform their duties. Such documentation could also help DLA avoid losing institutional knowledge as employees leave the office.

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## DOD Has Not Finalized Criteria for Releasing Materials for Use by the Defense Industrial Base

DOD has statutory requirements and guidance in place for managing various aspects of the stockpile—which includes acquiring, holding, selling excess materials that are no longer needed or usable, and disposing of materials. However, the department has not yet finalized its criteria for releasing stockpiled materials to the defense industrial base for use in support of national defense, such as an attack on the homeland or military conflict. Specifically, DLA follows the Strategic and Critical Materials Stock Piling Act's requirement to acquire critical materials for the stockpile from reliable sources. These include domestic sources and countries in the National Technology and Industrial Base, such as Canada and Australia.<sup>31</sup> In addition, DOD developed orientation guides for staff responsible for managing the depots where materials are held. These guides include directions on handling hazardous materials and safety maps of the property. DOD also has over 30 guidance documents that govern various aspects of the process for selling excess materials from the stockpile. These aspects include planning for the sale, generating contract documentation, and handling offers.<sup>32</sup>

The Strategic and Critical Materials Stock Piling Act permits the release of stockpiled materials to the industrial base under certain conditions. This includes release by the Under Secretary of Defense for Acquisition and Sustainment if the President has designated the authority and the Under Secretary determines that the release

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<sup>30</sup>GAO-14-704G.

<sup>31</sup>National Defense Authorization Act for Fiscal Year 2024, Pub. L. No. 118-31, § 1411 (2023).

<sup>32</sup>Examples of this guidance include Defense Logistics Agency, *Stockpile Sales Guidance—SSG-01: Strategic Plans and Sales Plans* (January 2021); *Stockpile Sales Procedures—SSP-02: Solicitation and Contract Award* (January 2021); and *Stockpile Sales Job Aid—SSJ-05: Manage Outbound Delivery* (January 2021).

is required for use, manufacture, or production for purposes of national defense.<sup>33</sup> More recently, Executive Order 14051, issued in October 2021, provided the Under Secretary of Defense for Acquisition and Sustainment with the authority to release stockpiled material for use.<sup>34</sup>

According to an official from DOD's Industrial Base Policy, DOD has begun to develop criteria to clarify the circumstances under which materials can be released under this new authority, but has not yet finalized it. DLA officials stated that since October 2021, several DOD organizations have asked questions about accessing the materials. For example, DLA officials said that the National Reconnaissance Office inquired about carbon fibers currently held in the stockpile as it was having difficulty securing supply from its single source in Japan. DLA officials told us that no materials have been released by the Under Secretary, in part, because the circumstances under which to do so are unclear.

*Standards for Internal Control in the Federal Government* states that management should establish an organizational structure, assign responsibility, and delegate authority to achieve the entity's objectives.<sup>35</sup> The standards further highlight the importance of updating policy to account for changing conditions—such as the change in DOD's authority for releasing stockpiled materials. For policies related to the industrial base, the Office of the Assistant Secretary of Defense for Industrial Base Policy is responsible for advising the Under Secretary of Defense for Acquisition and Sustainment.

While the Under Secretary of Defense for Acquisition and Sustainment was granted the authority to release stockpiled materials in October 2021, according to an official from DOD's Industrial Base Policy office, this office has only recently been tasked with the responsibility for developing the criteria that the Under Secretary may consider. The official added that the office is still in the initial stages of this effort and is currently coordinating across DOD and other stakeholders to understand their needs and concerns before drafting potential criteria. The official said the office is working toward having the criteria for releasing stockpiled materials finalized in early 2025, but this is an internal working date. Although the need for DOD to develop the criteria has been in effect for over 2 years, DOD has not established a formal timeline for doing so. Until the criteria for releasing stockpile materials is finalized, DOD cannot ensure consistent and efficient release of materials when needed.

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## DOD's Stockpile Reports to Congress Do Not Include Some Key Information on Risks

DOD regularly reports information to Congress on identified shortfalls and ongoing stockpile activities every 2 years, as required. However, its three most recent biennial requirements reports did not include key information such as risks associated with all materials or the progress DLA has made to address them.

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<sup>33</sup>Before 2013, stockpile materials could be released by the President or, during a time of war or a national emergency, the President's designee when determined that the release of such materials is required for purposes of national defense. In 2013, the disposal authorities in statute were amended to provide that the Under Secretary of Defense for Acquisition, Technology and Logistics (later updated to Undersecretary of Defense of Acquisition and Sustainment) could issue release orders for national defense purposes if designated by the President. National Defense Authorization Act for Fiscal Year 2013, Pub. L. No. 112-239; and National Defense Authorization Act for Fiscal Year 2020, Pub. L. No. 116-92 (2019).

<sup>34</sup>Exec. Order No. 14051, 86 Fed. Reg. 60,747 (Oct. 31, 2021).

<sup>35</sup>[GAO-14-704G](#).

Specifically, in its fiscal year 2023 stockpile requirements report to Congress, DOD chose to include information only on prioritized materials in shortfall rather than the complete list of identified shortfalls as it had in past iterations of the report. Additionally, DOD reported risk information, such as the weapon system affected, for modeled strategic and critical materials, but chose not to report such information for materials that DLA did not model. Finally, DOD did not report progress made toward implementing prior recommendations for addressing identified shortfalls.

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## DOD Reports Various Information on the Stockpile, Including Materials in Shortfall

DOD is statutorily required to provide a report to Congress on various aspects of the stockpile, including material requirements and the Secretary of Defense's recommendations to address them, on a biennial basis. Our review of the three reports that DOD submitted between fiscal years 2019 and 2023 found that DOD reported shortfalls for modeled materials, as well as the type and quantity of each material held in the stockpile.<sup>36</sup> DOD categorized these shortfalls by defense, essential civilian, and emergency investment to convey what areas would be affected if that material could not be accessed.<sup>37</sup> It also provided the associated dollar value DOD believes it would need to resolve the shortfalls.

Our analysis of these three reports shows that the number of material shortfalls that DOD identified increased by 167 percent during this time frame. The greatest increase in shortfalls has been in the defense category. Figure 7 shows the number of shortfall materials and the associated dollar value in fiscal years 2019 through 2023.

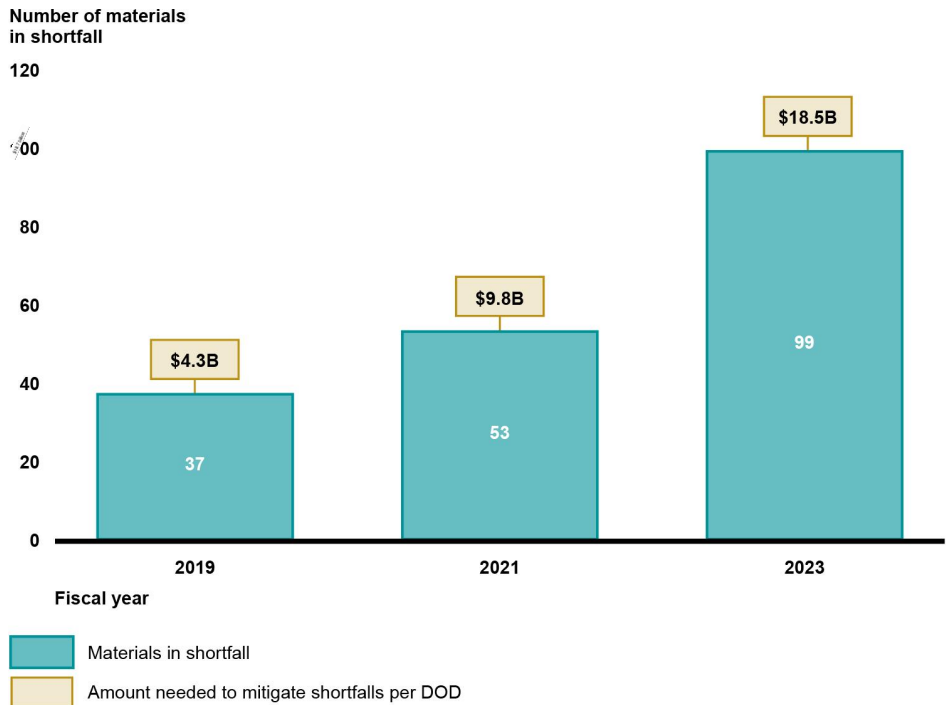
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<sup>36</sup>DOD, *Summary of the Strategic and Critical Materials 2019 Biennial Report on Stockpile Requirements* (Jan. 10, 2019); *Strategic and Critical Materials 2021 Report on Stockpile Requirements* (February 2021); and *Strategic and Critical Materials 2023 Biennial Report on Stockpile Requirements* (April 2023).

<sup>37</sup>DOD introduced the emergency investment category in fiscal year 2023 to focus on materials needed to build plants and other equipment to support additional demand.



**Figure 7: Number and Associated Dollar Value of Materials DOD Identified in Shortfall in Fiscal Year 2019 through 2023 Biennial Reports to Congress**



Source: GAO analysis of Department of Defense (DOD) documentation. | GAO-24-106959

**Accessible Data for Figure 7: Number and Associated Dollar Value of Materials DOD Identified in Shortfall in Fiscal Year 2019 through 2023 Biennial Reports to Congress**

	2019 (fiscal year)	2021 (fiscal year)	2023 (fiscal year)
Number of materials in shortfall	37	53	99
Amount needed to mitigate shortfalls per DOD	\$4.3 billion	\$9.8 billion	\$18.7 billion

Source: GAO analysis of Department of Defense (DOD) documentation. | GAO-24-106959

Note: The values are provided in then-year dollars. When adjusted for inflation to fiscal year 2023 dollars, the dollar value associated with fiscal years 2019 and 2021 shortfalls are \$5 billion and \$11 billion, respectively.

DOD attributes the overall increase in the number of materials identified in shortfall to analyzing more materials in fiscal year 2023 than in prior years, evolving market conditions, and revised planning assumptions.

- DOD modeled 148 materials in fiscal year 2023 compared to around 100 materials in both fiscal years 2019 and 2021, a nearly 50 percent increase. The increase in materials modeled resulted in more shortfalls identified. DLA officials told us they modeled more materials in fiscal year 2023 in response to the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, which authorized DOD to use appropriated funds for the stockpile to acquire any materials identified in the most recent biennial requirements report.<sup>38</sup> To make use of this authority, DLA officials told us that they

<sup>38</sup>James M. Inhofe National Defense Authorization Act for Fiscal Year 2023, Pub. L. No. 117-263. The Consolidated Appropriations Act, 2023, Pub. L. No. 117-328 ultimately appropriated \$93.5 million for the National Defense Stockpile.



analyzed all materials with available data that they believe pose a risk. DLA officials said they do not expect the number of materials analyzed to fluctuate significantly moving forward.

- DLA officials told us that issues such as conflicts and political and economic changes in countries affected market conditions that made it more difficult for DOD to obtain some materials. For example, the recent conflict in Ukraine made it more difficult for DOD to secure boron carbide that it primarily sources from that country.
- DLA officials told us they also adjusted planning assumptions, where possible, to incorporate real world data on how the market responded to emergencies, such as the COVID-19 pandemic. DLA officials said that incorporating real world data adds validity to their analyses since they cannot test the model against the planned national emergency scenario.

Our analysis found that the types of materials held in the stockpile, such as tin and zinc, remained relatively stable at about 50 types. We also found that DOD adjusted the quantity of nearly three-fourths of the materials it held between fiscal years 2019 and 2023 based on the results of its requirements analysis. Quantities for held materials ranged from a 100 percent decrease in tungsten alloys to a 692 percent increase in titanium. About half of the materials experienced an increase or decrease of 25 percent or more.

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## DOD Did Not Report Information on All Shortfalls in Fiscal Year 2023

In the fiscal year 2023 requirements report, DOD stated that 99 of the 148 materials it modeled were in shortfall. DOD only included the name and associated recommendations to address 23 of these materials, which DLA officials told us are their priorities given available funding.<sup>39</sup> The Strategic and Critical Materials Stock Piling Act requires DOD to provide recommendations to address stockpile requirements. In past reports, DOD chose to meet this requirement by providing information on all shortfalls and the recommended actions to address them. DLA officials stated that they developed recommendations for all material shortfalls identified in fiscal year 2023, but only reported DOD's top priorities.

In addition to the biennial requirements report, the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 included a new requirement for DOD to provide annual briefings that include a description of each material in shortfall and the objectives to be achieved if funding is provided. DOD's fiscal year 2023 briefing to meet this requirement also did not include information on all the shortfall materials identified in its fiscal year 2023 biennial requirement report.

*Standards for Internal Control in the Federal Government* states that management internally and externally should communicate necessary quality information to achieve the entity's objectives.<sup>40</sup> While highlighting the priority shortfalls is important information for decision-makers, including the complete list of shortfalls and recommended actions in the biennial requirement reports would also provide decision-makers with insight into all materials of concern.

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<sup>39</sup>Prioritizing shortfalls was new in fiscal year 2023 and DLA officials consider it an improvement to the process, as they believe it will allow them to acquire materials in a more effective order based on available resources.

<sup>40</sup>[GAO-14-704G](#).

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## DOD's Reports to Congress Do Not Include Risks for All Materials the Department Monitors

DOD provided risk information in the fiscal year 2023 requirements report for the strategic and critical materials determined to be in shortfall. Risk information provided included identifying the general weapon platform or type of product where the material is used. For example, the report states that rare earth elements like scandium and yttrium are critical across many major weapon systems, including lasers, radar, sonar, night vision systems, and missile guidance.<sup>41</sup>

DOD did not report risk information for the materials it did not model even though it has some information on why the materials are considered strategic or critical. For example, DLA's internal tracker of strategic and critical materials indicates that there is risk in obtaining quartz, used in global positioning systems and military radios, due to a small, uncertain supply market, but DOD did not include this information in its fiscal year 2023 requirements report. DLA officials told us that, more generally, they do not report on materials DOD cannot model because DOD does not have complete data and it is difficult to determine all relevant weapon systems or other uses of the materials across DOD.

*Standards for Internal Control in the Federal Government* states that management should internally and externally communicate the necessary quality information to achieve the entity's objectives.<sup>42</sup> Reporting risks associated with shortfalls of modeled and unmodeled critical materials, even if complete information is not available, would help ensure all relevant information on stockpile requirements is communicated effectively to decision-makers.

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## DOD's Reports to Congress Do Not Identify Progress on Actions Previously Identified

DOD did not report progress on actions it has taken to address previously identified shortfalls in the three biennial requirement reports we reviewed. In fiscal year 2021, for example, DOD recommended 47 actions: 28 to stockpile a material, nine to maintain the current stockpile of a material, and 10 to study the supply chain further. However, the fiscal year 2023 report did not provide an update on steps taken to address these recommendations.<sup>43</sup>

We reviewed DOD documents and identified actions that DOD took or planned to take to address some of these recommendations between the fiscal year 2021 and fiscal year 2023 requirement reports. Specifically, we found the following:

- DOD awarded contracts for one of the 28 materials it recommended for stockpiling.<sup>44</sup> DOD identified an additional 18 materials in either subsequent execution plans or annual material plans as

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<sup>41</sup>DOD, *Strategic and Critical Materials 2023 Biennial Report on Stockpile Requirements* (April 2023).

<sup>42</sup>GAO-14-704G.

<sup>43</sup>For 12 of the 28 recommendations to stockpile the material, DOD also recommended qualifying a domestic source. For materials that DOD recommends to further study, DLA officials told us that there is not one standard format and that this can be done through either deep dive studies, data reports, market research, or business case analyses.

<sup>44</sup>DOD awarded three additional contracts for shortfall materials in fiscal year 2023. According to DLA officials, they will continue to acquire materials as they receive appropriated funds and will report details in execution plans to Congress.

potential acquisitions. We could not determine DOD's timetable for acquiring the remaining nine materials that were recommended for stockpiling.

- DOD continued to stock the nine materials identified in the fiscal year 2021 report, as recommended.
- DOD completed studies for eight of the 10 materials as recommended in the fiscal year 2021 report.<sup>45</sup> Partly as a result, DOD determined that it should stockpile two of the materials that it originally recommended for further study in fiscal year 2021. We could not determine additional results.

According to DLA officials, DLA does not have processes in place to report on the status of recommended stockpile actions included in the biennial requirements reports. However, some actions are tracked internally and reported in other documents. For example, DLA officials said that they hold weekly manager meetings and weekly acquisition meetings to discuss progress on procurement actions and receipt of materials under contract. Procurement actions are included in DOD's execution plans and annual operations and planning reports to Congress.<sup>46</sup> However, DLA does not report on results or completion of recommended studies in any of its stockpile reports to Congress.

*Standards for Internal Control in the Federal Government* states that management should communicate necessary quality information internally and externally to achieve the entity's objectives.<sup>47</sup> By tracking and reporting outcomes of previous recommendations in the biennial requirements reports, DOD would provide Congress and the department greater insight into the steps it is taking to address material shortfalls. Without this information, congressional and DOD decision-makers do not have insight into the extent to which recommended actions have been implemented to address reported shortfalls.

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## DOD Is Heavily Reliant on Foreign and Single Domestic Sources for Shortfall Materials

DOD is heavily reliant on foreign or single domestic sources of supply for the 99 materials it identified as in shortfall in the fiscal year 2023 requirements report and has undertaken some efforts to reduce that reliance.<sup>48</sup> As shown in figure 8, over 90 percent of the materials in shortfall have one or no domestic sources of supply.

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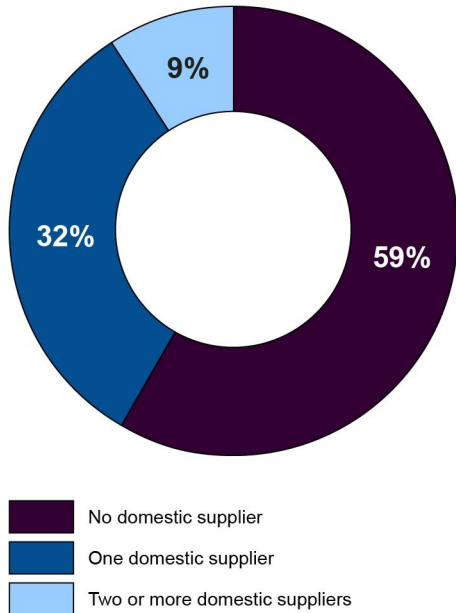
<sup>45</sup>According to DLA officials, DLA completed studies for two of the five types of carbon-carbon and expects to finish the remaining three by October 2024.

<sup>46</sup>The Consolidated Appropriations Acts of 2022 and 2023 required DOD to submit an execution plan detailing how the appropriated funds were going to be used before obligating or expending the funds. Pub. L. No. 117-103, § 8035 (2022); and Pub. L. No. 117-328, § 8035 (2022). DOD provided its acquisition plans for five strategic and critical materials in its fiscal year 2022 and 2023 execution plans.

<sup>47</sup>[GAO-14-704G](#).

<sup>48</sup>DOD identified 99 unique materials in shortfall in fiscal year 2023. DOD determined that 11 of these materials could be mitigated through either substitution, thrift, or extra sell in the event of a national emergency and do not require further action. Substitution involves replacing a material that is difficult or impossible to obtain in sufficient quantities with another material that has similar performance but is easier to acquire. Thrift involves industry pursuing initiatives to use less of the shortfall materials. Extra sell involves U.S. access to previously unused foreign production capacity of materials from allies and friendly nations at a higher-than-normal price.

**Figure 8: Available Domestic Suppliers for the 99 Material Shortfalls in Fiscal Year 2023**



Source: GAO analysis of Department of Defense data. | GAO-24-106959

**Accessible Data for Figure 8: Available Domestic Suppliers for the 99 Material Shortfalls in Fiscal Year 2023**

Category	Percentage
No domestic supplier	58 materials
One domestic supplier	32 materials
Two or more domestic suppliers	9 materials
<b>TOTAL</b>	<b>99 materials</b>

Source: GAO analysis of Department of Defense data. | GAO-24-106959

Note: DOD has determined that 11 of the 99 materials in shortfall can be mitigated through other means, such as by substituting a shortfall material for another, more readily available material that meets the same need.

As discussed above, DOD identified 23 materials in shortfall as priorities in the fiscal year 2023 biennial requirements report. Eight of the 23 materials had no domestic sources, 11 had a single domestic source, and four had more than one domestic source. Table 1 provides information on the shortfall and associated sources of supply for the eight prioritized materials without a domestic supplier in fiscal year 2023.

**Table 1: Available Sources for Prioritized Strategic and Critical Material Shortfalls without a Domestic Supplier, Fiscal Year 2023**

Material	Main source countries
Chromium metal	Russia, United Kingdom, China, France
Indium	Canada, China, France, Belgium
Lanthanum	China, France, Estonia, Malaysia
Manganese metal, electrolytic	Israel, Russia, Canada, Turkey, Germany
Niobium	Brazil, Canada
Scandium	China
Steel, 1080 grade tire cord	Japan, Brazil
Titanium sponge	Japan, Kazakhstan

Source: GAO analysis of Defense Logistics Agency documentation. | GAO-24-106959

DOD plans to address shortfalls for the majority of the prioritized materials through some form of stockpiling, including six in table 1 above that are currently only available from foreign sources. It plans to study the supply chains of the remaining prioritized materials further before recommending an action. For example, actions could include initiating recycling efforts, funding research and development programs, or establishing domestic sources of supply—actions DLA has already taken for some materials.

- Recycling.** DLA currently has two active recycling programs to extract germanium and boron carbide materials from military equipment no longer in use or marked for disposal. Germanium is a key material in night vision equipment that China placed export restrictions on in fiscal year 2023. Through its recycling program, DLA expected to secure roughly 10 percent of the nationwide U.S. demand for purified germanium in 2023. Boron carbide is a key material in body armor for which, according to a DOD report, the U.S. is almost entirely reliant on foreign sources to obtain. Through its recycling program, DLA was able to secure boron carbide powder that meets Army warfighter requirements.
- Research and development.** DLA invests in research and development efforts for material substitutes or new means for mining or refining materials that do not involve relying on foreign sources. In fiscal year 2022, DLA reported supporting seven research and development projects totaling \$3.7 million. For example, one of these projects focused on developing a new process for recovering rare earth elements.
- Establishing a reliable source.** DLA assists U.S. companies capable of providing a strategic or critical material to become qualified as a supplier with DOD.<sup>49</sup> This includes helping companies navigate DOD’s qualification process or funding their applications, which, according to DLA officials, costs anywhere from \$250,000 to \$3 million depending on the material. For example, in fiscal year 2020, DLA reported providing funding to qualify a U.S. company sourcing antimony trisulfide—a material used in explosives—from Mexico to replace the only qualified source located in China. According to DLA officials, DLA helped to qualify 10 companies from fiscal years 2019 through 2023.

<sup>49</sup>The Strategic and Critical Materials Stock Piling Act previously provided for developing “domestic sources.” The National Defense Authorization Act for Fiscal Year 2024, Pub. L. No. 118-31, § 1411 (2023) changed the act to provide for developing “reliable sources.” The definition of reliable sources is broader than the definition of domestic sources. Reliable sources include citizens or business entities in nations in the national technology and industrial base (such as Australia and Canada) and nations listed as qualifying countries in the Defense Federal Acquisition Regulation Supplement § 225.003 (such as Austria and Spain). 50 U.S.C. § 98h-3.

According to DLA officials, while these efforts are important, they are small in scope and are not able to address all material needs. DOD estimated that it would need \$18.5 billion to eliminate the risks for all shortfalls in fiscal year 2023, which is more than 80 times the funding received for the stockpile in the last 5 fiscal years. According to DLA officials, DOD will continue to stockpile shortfall materials as funding becomes available.

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## Conclusions

Strategic and critical materials are essential to manufacturing weapon systems and essential civilian needs such as the U.S. power grid, which maintain the U.S. military advantage and bolster national security. DOD has longstanding efforts to understand its needs for these materials and secure access to them. However, while DOD has a strong process in place to determine material requirements, aspects of how it plans and manages the National Defense Stockpile could be improved. Specifically, obtaining necessary data from DOD program offices and other entities for all materials considered strategic and critical could help ensure that requirements for the most critical materials are known. Additionally, documenting the process for determining actions to address materials in shortfall could help ensure consistency in DOD's stockpiling efforts. Further, given recent expansions in DOD's authority to release stockpiled materials for use, finalizing criteria would help guide these efforts and ensure an efficient release of materials when needed.

Congress and DOD leadership do not have full insight into the entirety of material concerns and actions taken to address them, in part because DOD is not reporting all the information it has available. Specifically, DOD is not reporting all identified material shortfalls, associated risks, or its progress toward implementing recommendations to mitigate risks in its biennial requirements reports. Without this reporting, Congress and DOD leadership will continue to have incomplete information on the severity of material shortfalls and the additional actions or resources that may be needed to mitigate risks.

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## Recommendations for Executive Action

We are making the following six recommendations to DOD:

The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment identifies roles and defines responsibilities for relevant DOD entities to provide the necessary supply and demand information on the materials they consider strategic or critical to support DOD's biennial stockpile requirement reports. (Recommendation 1)

The Secretary of Defense should ensure the Defense Logistics Agency documents the process for determining actions to address a material shortfall, such as in guidance or job aids. (Recommendation 2)

The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment finalizes criteria to release stockpiled materials for use under Executive Order 14051. (Recommendation 3)

The Secretary of Defense should ensure the Defense Logistics Agency reports the complete list of material shortfalls to Congress while continuing to highlight priority materials. (Recommendation 4)

The Secretary of Defense should ensure the Defense Logistics Agency reports information on the risks of unmodeled critical materials to Congress. (Recommendation 5)

The Secretary of Defense should ensure the Defense Logistics Agency reports progress on prior recommendations made to address material shortfalls to Congress. (Recommendation 6)

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## Agency Comments

We provided a draft of this report for review and comment to the Department of Defense. DOD provided written comments on the report, which are reproduced in appendix II. In its comments, DOD concurred with each of our six recommendations.

In concurring with recommendations one through three, DOD noted that it will define roles and responsibilities as well as establish criteria and job aides where necessary to (1) consolidate supply and demand data, (2) formalize the process used to determine appropriate actions to address a shortfall, and (3) release stockpiled materials for use. In concurring with recommendations four and five, DOD noted that it will include additional information on all material shortfalls and potential risks associated with unmodeled materials in its future biennial stockpile requirements reports to Congress. Additionally, with regard to recommendation six, DOD noted that it will include progress on prior recommendations made to address material shortfalls in its National Defense Stockpile Annual Operations and Planning Report. DOD stated that this information was included in its most recent iteration provided to Congress in June 2024 which was during the review timeframe for this report.

We are sending copies of this report to the appropriate congressional committee as well as the Secretary of Defense. In addition, the report will be available at no charge on the GAO website at <https://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-4841 or [russellw@gao.gov](mailto:russellw@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix III.



W. William Russell  
Director, Contracting and National Security Acquisitions

# Appendix I: Objectives, Scope, and Methodology

The House report accompanying the James M. Inhofe National Defense Authorization Act for Fiscal Year 2023 includes a provision for GAO to review the Department of Defense’s (DOD) national defense stockpiling efforts. This report examines (1) the extent to which DOD has established processes for determining requirements and managing the strategic and critical material stockpile, (2) the extent to which DOD reported to Congress on changes to its strategic and critical materials stockpile from fiscal years 2019 through 2023 and remaining risks, and (3) DOD’s reliance on foreign and single domestic sources of supply to address shortfalls.

To address the first objective, we analyzed relevant policies, guidance, and reports to understand DOD’s approach for determining stockpile requirements and managing the stockpile. Specifically, we analyzed available DOD and Institute for Defense Analyses (IDA) documentation on the models used to generate stockpile requirements.<sup>1</sup> We compared DOD and IDA modeling process to key elements in our Assessment Methodology for Economic Analysis.<sup>2</sup> These key elements are detailed in table 2.

**Table 2: GAO’s Key Elements of Economic Analysis**

Key element	Description
Objective and scope	The economic analysis explains the action examined and includes a rationale and justification for the action. The analysis states its objective. The scope of the analysis is designed to address this objective. Unless otherwise justified, the analysis focuses on economic effects that accrue to citizens and residents of the United States, and its time horizon is long enough to encompass the important economic effects of the action.
Methodology	The economic analysis examines the effects of the action by comparing alternatives, using one of them as the baseline. Unless otherwise justified, it considers alternatives that represent all relevant alternatives, including that of no action. The analysis defines an appropriate baseline. The analysis justifies that the world specified under each alternative considered (including the baseline) represents the best assessment of what the world would be like under that alternative. The analysis identifies the important economic effects for each alternative considered, their timing, and whether they are direct or ancillary effects.
Analysis of effects	Where feasible, the economic analysis quantifies the important economic effects and monetizes them using the concept of opportunity cost. The analysis applies the criterion of net present value, or related outcome measures, to compare these effects across alternatives. It controls for inflation and uses economically justified discount rates. Where important economic effects cannot be quantified, the analysis explains how they affect the comparison of alternatives. Where the equity and distributional impacts are important, the full range of these impacts is separately detailed and quantified, where feasible.
Transparency	The economic analysis describes and justifies the analytical choices, assumptions, and data used. The analysis assesses how plausible adjustments to each important analytical choice and assumption affect the estimates of the economic effects and the results of the comparison of alternatives. The analysis explains the implications of the key limitations in the data used. Where feasible, the analysis adequately quantifies how the statistical variability of the key data elements underlying the estimates of the economic analysis impacts these estimates, and the results of the comparison of alternatives.

<sup>1</sup>Examples include: James S. Thomason et al., Institute for Defense Analyses, *Computation of Material Demand in the Risk Assessment and Mitigation Framework for Strategic Materials (RAMF-SM) Process* (August 2015); *An Overview of Step 2 of the Risk Assessment and Mitigation Framework for Strategic Materials (RAMF-SM)* (March 2015); and *Weapon-Specific Strategic Material Estimation Process (WSSMEP)* (December 2014).

<sup>2</sup>GAO, *Assessment Methodology for Economic Analysis*, [GAO-18-151SP](#) (Washington, D.C.: Apr. 10, 2018).



Key element	Description
Documentation	The economic analysis is clearly written, with a plain language summary, clearly labeled tables that describe the data used and results, and a conclusion that is consistent with these results. The analysis cites all sources used and documents that it is based on the best available economic information. The analysis documents that it complies with a robust quality assurance process and, where applicable, the Information Quality Act. The analysis discloses the use and contributions of contractors and outside consultants.

Source: Reproduction of information included in GAO-18-151SP. | GAO-24-106959

We interviewed relevant officials from the Office of the Under Secretary of Defense for Acquisition and Sustainment’s Policy and Industrial Base Policy offices, the Defense Logistics Agency (DLA), and IDA. These interviews helped us understand the process used to develop material requirements such as the sources of data, the assumptions that underpin the models, outputs of the models, and how DOD determines the appropriate action to mitigate an identified shortfall. We determined that the federal internal control standard for information and communication was significant to this objective—specifically, that management should maintain documentation that establishes and communicates roles and responsibilities. We compared DOD’s process for determining requirements against this principle and identified Strategic and Critical Stock Piling Act legislative requirements.<sup>3</sup>

To understand how materials in the stockpile are managed, we reviewed DOD guidance on acquiring, storing, selling, and releasing materials for use. We also reviewed relevant legislative and executive authorities related to management of the stockpile. We interviewed relevant officials from the Office of the Under Secretary of Defense for Acquisition and Sustainment’s Policy and Industrial Base Policy offices, and DLA, to understand their roles and processes in managing the stockpile, including how materials would be released in case of a national emergency.

To address the second objective, we analyzed information in DOD’s three most recent strategic and critical materials biennial reports on stockpile requirements that covered stockpile activities for the last 5 fiscal years—2019 through 2023. We compared stockpile activities detailed in these reports to identify changes and trends in materials held and determined to be in shortfall. We also reviewed the biennial reports to identify what information was being reported to Congress about the stockpile and identified shortfalls. For the purposes of this report, we determined the data included in DOD’s requirements reports were sufficiently reliable.

Additionally, we analyzed relevant sections of DOD’s execution plans for appropriated national defense stockpile funds, national defense stockpile annual operations and planning reports, contract awards, and other DOD documentation from fiscal year 2021 to fiscal year 2023. This allowed us to identify actions DOD took to implement recommendations in the fiscal year 2021 requirements report. Details surrounding the fiscal year 2019 requirements report are classified and were not included in this review. We determined that the federal internal control standard for information and communication was significant to this objective—specifically, that management should communicate information requirements in a timely manner to achieve objectives. We assessed information that DOD reported in its biennial requirement reports against this principle.

To address the third objective, we reviewed DOD’s annual operations and planning report’s section on foreign and domestic purchases of materials, the biennial stockpile requirement reports from fiscal year 2019 through fiscal year 2023, as well as material flow diagrams for strategic and critical materials. This allowed us to identify trends and reliance on foreign sources. We compared materials identified in shortfall in the fiscal year

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<sup>3</sup>Act of June 7, 1939, Pub. L. No. 76-117, ch. 190 (codified as amended at 50 U.S.C. §§ 98–100a). GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).

2023 biennial requirements report to source documentation provided by DOD to determine domestic and foreign availability.

To get a full picture of how the stockpile fits into the broader industrial base strategy, we reviewed relevant sections in a White House report published in response to Executive Order 14017 to identify recommendations aimed at mitigating the risk of overreliance on foreign supply.<sup>4</sup> We reviewed documentation related to additional efforts beyond stockpiling that DLA is undertaking to minimize the risk of foreign dependence, such as its efforts to help qualify U.S. companies to supply materials and to establish recycling programs. We also interviewed relevant officials from the Office of the Under Secretary of Defense for Acquisition and Sustainment's Policy and Industrial Base Policy office and DLA to understand the steps DOD is taking to mitigate risks associated with reliance on foreign sources.

We conducted this performance audit from July 2023 to September 2024 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>4</sup>The White House, *Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth: 100-Day Reviews under Executive Order 14017* (June 2021).

# Appendix II: Comments from the Department of Defense



OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE  
3000 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3000

INDUSTRIAL BASE POLICY

AUG 20 2024

Mr. William Russell  
Director, Contracting and National Security Acquisitions  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC, 20548

Dear Mr. William Russell

This is the Department of Defense (DoD) response to the GAO Draft Report GAO-24-106959, "NATIONAL DEFENSE STOCKPILE: Action Needed to Improve DOD's Efforts to Prepare for Emergencies" dated May 13, 2024 (GAO Code 106959).

Attached is DoD's response to the subject report. My point of contact is Mr. Adam Burstein, at [adam.c.burstein.civ@mail.mil](mailto:adam.c.burstein.civ@mail.mil) or phone (703) 697-1065.

Sincerely,

A handwritten signature in black ink, appearing to read "Vic S. Ramdass", is positioned above the typed name and title.

Vic S. Ramdass, PhD.  
Principal Deputy Assistant Secretary of Defense  
for Industrial Base Policy

**GAO DRAFT REPORT (GAO CODE 106959) “NATIONAL DEFENSE STOCKPILE:  
ACTIONS NEEDED TO IMPROVE DOD’S EFFORTS TO PREPARE FOR  
EMERGENCIES”**

**DOD COMMENTS TO THE GAO RECOMMENDATIONS**

- **RECOMMENDATION 1:** The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment identifies roles and defines responsibilities for relevant DOD entities to provide the necessary supply and demand information on the materials they consider strategic or critical to support DoD’s biennial stockpile requirement reports.
  - **DOD RESPONSE:** Concur. The Department will define roles and responsibilities and work to consolidate supply and demand information from key DOD entities and ensure this information supports the development of the biennial stockpile requirements report moving forward.
- **RECOMMENDATION 2:** The Secretary of Defense should ensure the Defense Logistics Agency documents the process for determining actions to address a material shortfall, such as in guidance or job aids.
  - **DOD RESPONSE:** Concur. DLA will create a job aid to capture the process that is used to identify appropriate actions to address material shortfalls. DOD and DLA work to continually improve the methodology and analytical techniques used for prioritizing material shortfalls and recommending associated actions. Objective, optimized approaches for shortfall prioritization were utilized by the current Requirements Report and have been documented in technical papers and briefing slides. DLA will ensure that it documents the objective criteria and process used to guide actions for addressing material shortfalls.
  - **Estimated Completion Date:** January 15, 2025
- **RECOMMENDATION 3:** The Secretary of Defense should ensure the Under Secretary of Defense for Acquisition and Sustainment finalizes criteria to release stockpiled materials for use under Executive Order 14051.
  - **DOD RESPONSE:** Concur. The Department is working to develop a comprehensive criteria, as well as a standard operation procedure (SOP), for releasing stockpiled materials from the NDS. This will allow the NDS to be more agile to respond to supply disruptions.
- **RECOMMENDATION 4:** The Secretary of Defense should ensure the Defense Logistics Agency reports the complete list of material shortfalls to Congress while continuing to highlight priority materials.

- **DO RESPONSE:** Concur. DLA will include the complete list of material shortfalls to Congress in the biennial Requirements Report. The complete list of material shortfalls had been included in prior versions of the requirements report; however, a truncated list was included in the 2023 Requirements Report. All future reports will contain the full list.
- **Estimated Completion Date:** January 15, 2025
- **RECOMMENDATION 5:** The Secretary of Defense should ensure the Defense Logistics Agency reports information on risks of unmodeled critical materials to Congress.
  - **DOD RESPONSE:** Concur. Such materials present potentially unknown risks to the defense industrial base and essential civilian economy. There are several reasons for limited material data. These reasons include the small size of the market, the existence of proprietary or classified information regarding the material, sensitive intellectual property issues, or foreign ownership/controlling interest (FOCI) of the company producing the material. DLA currently includes a section in the Requirements Report acknowledging the risk from these materials for which there is scarce data or insufficient knowledge of the supply chain. DLA will expand on this section by compiling risk information on unmodeled critical materials from DOD components and include this information in the biennial report to Congress.
  - **Estimated Completion Date:** January 15, 2025
- **RECOMMENDATION 6:** The Secretary of Defense should ensure the Defense Logistics Agency reports progress on prior recommendations made to address material shortfalls to Congress.
  - **DOD RESPONSE:** Concur. DOD/DLA provides a series of reports to Congress that function as a cycle, documenting shortfalls, planning the expenditure of funding to reduce shortfalls, and finally, documenting actions taken in the previous year to address shortfalls. The Requirements Report's purpose is to make recommendations as to what actions, if any, DOD/DLA should undertake to mitigate risk. DOD/DLA submits an Execution Plan to Congress on materials it plans to purchase with appropriated funding. The final step in the cycle is an annual Operations and Planning Report to document actions taken over the prior year. The DOD/DLA reports progress on prior recommendations made to address material shortfalls to Congress in the National Defense Stockpile Annual Operations and Planning Report.
  - Per the Strategic and Critical Materials Stock Piling Act (50 U.S.C. §98h-2(b)) DOD submits:
    - The biennial Requirements Report which must include:

- 
- 
- The recommendations with respect to stockpile requirements; the national emergency planning assumptions used in making recommendations with respect to stockpile requirements; an examination of the effect that alternative mobilization periods under the military conflict scenario required under subsection; and a range of other military conflict scenarios addressing potentially more serious threats to national security, would have on the Secretary's recommendation.
  - The National Defense Stockpile Annual Operations and Planning Report which must include:
    - Information with respect to foreign and domestic purchases of materials during the preceding FY; information with respect to the activities by the Stockpile Manager to encourage the conservation, substitution, and development of strategic and critical materials within the United States; information with respect to the research and development (R&D) activities conducted under Section 8 of the Act; and other pertinent information on the administration of this Act as will enable Congress to evaluate the effectiveness of the program provided.
  - The FY23 National Defense Stockpile Annual Operations and Planning Report was provided to Congress on June 3, 2024.
  - **Completion Date:** June 3, 2024

# Accessible Text for Appendix II: Comments from the Department of Defense

AUG 20 2024

Mr. William Russell  
Director, Contracting and National Security Acquisitions  
U.S. Government Accountability Office  
441 G Street, NW  
Washington, DC. 20548

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Sincerely,

Vic S. Ramdass, PhD.  
Principal Deputy Assistant Secretary of Defense for Industrial Base Policy

## **GAO DRAFT REPORT (GAO CODE 106959) "NATIONAL DEFENSE STOCKPILE: ACTIONS NEEDED TO IMPROVE DOD's EFFORTS TO PREPARE FOR EMERGENCIES"**

### **DOD COMMENTS TO THE GAO RECOMMENDATIONS**

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DOD RESPONSE: Concur. The Department will define roles and responsibilities and work to consolidate supply and demand information from key DOD entities and ensure this information supports the development of the biennial stockpile requirements report moving forward.

RECOMMENDATION 2: The Secretary of Defense should ensure the Defense Logistics Agency documents the process for determining actions to address a material shortfall, such as in guidance or job aids.

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Estimated Completion Date: January 15, 2025

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Per the Strategic and Critical Materials Stock Piling Act (50 U.S.C. §98h-2(b)) DOD submits:

The biennial Requirements Report which must include:

The recommendations with respect to stockpile requirements; the national emergency planning assumptions used in making recommendations with respect to stockpile requirements; an examination of the effect that alternative mobilization periods under the military conflict scenario required under subsection; and a range of other military conflict scenarios addressing potentially more serious threats to national security, would have on the Secretary's recommendation.

The National Defense Stockpile Annual Operations and Planning Report which must include:

Information with respect to foreign and domestic purchases of materials during the preceding FY; information with respect to the activities by the Stockpile Manager to encourage the conservation, substitution, and development of strategic and critical materials within the United States; information with respect to the research and development (R&D) activities conducted under Section 8 of the Act; and other pertinent information on the administration of this Act as will enable Congress to evaluate the effectiveness of the program provided.

The FY23 National Defense Stockpile Annual Operations and Planning Report was provided to Congress on June 3, 2024.

Completion Date: June 3, 2024

# Appendix III: GAO Contact and Staff Acknowledgments

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## GAO Contact

W. William Russell, (202) 512-4841 or [RussellW@gao.gov](mailto:RussellW@gao.gov)

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## Staff Acknowledgments

In addition to the contact named above, the following staff members made key contributions to this report: Cheryl Andrew, Assistant Director; Erin Carr, Analyst-in-Charge; Pete Anderson; Breanne Cave; Noelle Du Bois; Scott Hepler; Courtney LaFountain; Sophia Payind; Anne Louise Taylor; Alyssa Weir; Adam Wolfe; and Candice Wright.



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