BEFORE THE
BUREAU OF INDUSTRY AND SECURITY
U.S. DEPARTMENT OF COMMERCE

PETITION FOR RELIEF UNDER SECTION 232

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I. REQUEST FOR RELIEF UNDER SECTION 232

On behalf of AMG Vanadium LLC ("AMG") and U.S. Vanadium, LLC ("U.S. Vanadium"), United States manufacturers of vanadium products ("Petitioners"), we request that the Secretary of Commerce (the "Secretary") initiate an investigation under section 232 of the Trade Expansion Act of 1962, as amended, 19. U.S.C. § 1862 ("Section 232"), regarding the effect of imports of certain vanadium products on the national security of the United States. The Secretary should find that vanadium, as defined below, is being imported into the United States in such quantities and under such conditions as to threaten to impair the national security and should recommend that the President take appropriate action.

II. EXECUTIVE SUMMARY

AMG is a manufacturer of specialty metals used by steel producers for automotive, aerospace, oil and gas pipeline, defense, and infrastructure applications. U.S. Vanadium produces vanadium pentoxide and vanadium chemicals that are used in aerospace, chemical, battery, and steel application. In addition to AMG and U.S. Vanadium, the domestic vanadium industry includes several other companies that produce either ferrovanadium or vanadium pentoxide. Nearly all of the vanadium producers in the domestic industry have experienced some form of major operational difficulty, including bankruptcy, plant closure, or idled operations. As a result, Petitioners request that the Secretary investigate imports of vanadium under Section 232, including vanadium oxides (including vanadium pentoxide and vanadium trioxide), vanadium carbonitrides, ferrovanadium, and vanadates. These vanadium products are

respectively classified under subheadings 2825.30.00, 2849.90.50, 7202.92.00, and 2841.90.10 of the Harmonized Tariff Schedules of the United States ("HTSUS").[1]

Relief should be granted under Section 232 because vanadium is essential to U.S. national security. Vanadium has been recognized in various ways and by various government agencies as critical or essential to the national and economic security of the United States. Both the Executive and Legislative Branches of the U.S. Government have designated vanadium as a critical mineral that is essential to U.S. national security. In addition, vanadium is a vital input in critical infrastructure sectors identified by the U.S. Department of Homeland Security, including the Critical Manufacturing Sector (including primary metals, machinery, and transportation) and the Defense Industrial Base Sector (including aircraft, combat vehicles, and armor).

Because vanadium is used principally in the production of high-strength metal alloys, including steels used in myriad applications and titanium alloys critical in jet engines, air frames, missiles, night vision technology, laser guidance systems, and other infrastructure and energy applications, the United States requires vanadium for both national defense and critical infrastructure purposes. For example, vanadium is used to strengthen steel used in a variety of military applications. In its Steel 232 Report issued in 2018, the Bureau of Industry and Security ("BIS") found that "steel articles are critical to the nation's overall defense objectives." BIS also explained that, "[t]he U.S. Department of Defense ("DoD") has a large and ongoing need for a range of steel products that are used in fabricating weapons and related systems for the nation's defense." Given that vanadium is integral to high strength, low-alloy steels used in these

[1] Petitioners provide the above 8-digit HTSUS item numbers with the understanding that all subsidiary 10-digit HTSUS item numbers within the 8-digit HTSUS subheading will also be included within the scope of this investigation.

applications, vanadium is by definition also critical or essential to the nation's overall defense objectives.

Vanadium is also used in a variety of infrastructure sectors deemed critical by the U.S. Government. Some examples of critical infrastructure applications that contain vanadium include reinforcing bar used for buildings and bridges; oil and gas pipelines; structural steels used in chemical plants and office buildings; Hadfield steels used in railway cars, and other steels used in railway applications; transportation and construction machinery of all types; turbines; and chemical applications. Vanadium therefore is necessary to build, maintain, and support U.S. critical infrastructure that is vital to both the economic and national security of the United States.

Furthermore, imports of vanadium adversely impact the economic welfare of the domestic vanadium industry. The United States is heavily reliant on vanadium imports, which pose risks for supply disruptions. Import prices undercut U.S. prices and vary dramatically in the short term. This creates uncertainty in the domestic market, which in turn inhibits planning for technology investment, research and development, and capacity expansion necessary to sustain this critical domestic industry and to provide a significant portion of domestic demand.

Import volume trends, in particular, demonstrate the adverse circumstances facing the domestic industry. Over the past 25 years, U.S. producers of ferrovanadium have been injured repeatedly by unfairly traded imports from multiple sources. Although U.S. producers of ferrovanadium have successfully defended against unfairly traded imports in domestic trade remedy proceedings, new foreign exporters continued to emerge and dump ferrovanadium into the U.S. market.

Domestic vanadium producers also operate at a competitive disadvantage relative to foreign vanadium producers. Specifically, vanadium producers in the United States must comply with stringent environmental and safety regulations, which increase costs and weaken domestic producers' ability to compete with foreign producers. Vanadium regulation in competing countries is relatively limited compared to the robust regulatory framework in the United States. Foreign vanadium producers therefore enjoy advantages relative to U.S. vanadium producers as a result of less stringent regulations. The disparity between the U.S. regulatory framework and that of its competitors is stark, with vast differences in production costs placing U.S. producers at a competitive disadvantage.

The value-added tax ("VAT") regime in effect in almost every country other than the United States also disadvantages the domestic vanadium industry relative to foreign producers. Foreign producers of vanadium receive rebates of domestic VAT upon export and do not pay VAT when importing to the United States, while U.S. vanadium exporters are subject to VAT in the destination countries. This increases the price of U.S. vanadium relative to foreign vanadium in foreign markets. Accordingly, the competitive environment in the vanadium industry is distorted, favoring foreign imports and disfavoring U.S. exports.

In addition, global market volatility has weakened the domestic vanadium industry. The global market is characterized by highly volatile vanadium prices and particular susceptibility to market distortions caused by Chinese industrial policies. China is both the largest supplier and largest consumer of vanadium globally, and as a result, abrupt and consequential policy shifts by China result in significant effects on world vanadium supply, demand, and price. Together, these forces have caused market tightness and have inhibited the investment necessary to develop and maintain a healthy domestic vanadium industry in the United States.

Absent a stable market, U.S. vanadium producers will be unable to sustain operations and some likely will again be forced to suspend their attempts to restart or expand their operations. Because the domestic suppliers of vanadium cannot meet domestic demand, U.S. vanadium consumers are forced to rely in large part on foreign suppliers. Given that global vanadium supply and demand is driven substantially by China, the domestic vanadium industry, which is critical to our national and economic security, is particularly vulnerable to the distorting effects of Chinese policy shifts.

Finally, the displacement of the domestic vanadium industry threatens to impair the national and economic security of the United States. The U.S. vanadium industry has struggled for 25 years in the face of unfair trade. While the 2018 price increases helped to provide a renewed interest in this market, the subsequent steep price decreases in 2019 serve as a stark reminder of the difficulties associated with developing the U.S. vanadium market. Given the strategic significance of vanadium to U.S. critical infrastructure and the U.S. defense industrial base, the displacement of the domestic industry by imports of vanadium seriously threatens the national and economic security of the United States.

The viability of the domestic industry is in danger. Historically, a number of U.S. manufacturers had the operating capacity to serve as reliable domestic suppliers. Nevertheless, many of these companies experienced difficulties caused by imports, including bankruptcy, plant closure, or idled operations. As a result, the domestic vanadium industry has experienced significant declines in employment, declines in critical U.S. output of vanadium, loss of market share, and significant financial losses. Domestic production, therefore, is unable to meet the domestic demand requirements necessary for critical defense and infrastructure applications resulting in reliance on foreign suppliers. Given that the majority of foreign vanadium supplies

are produced and thereby controlled by China and Russia, the U.S. vanadium supply is critically vulnerable to disruption by these strategic competitors.

Petitioners seek assistance under Section 232 during this critical period when the U.S. vanadium industry is attempting to restart idled operations or expand existing operations. A number of domestic vanadium producers, including Petitioners, currently seek to increase production capacity or restart currently idled operations. It is imperative that relief be granted under Section 232 in order to ensure that domestic producers of vanadium are capable of meeting domestic requirements of this critical material. However, absent assistance under Section 232, the domestic industry will struggle to achieve the growth necessary to be viable relative to established competitors, as well as new competitors coming online in various countries. Petitioners therefore request that relief be granted under Section 232 in the form of tariffs or tariff rate quotas on vanadium as explained in Section XI. Specifically, Petitioners request that the Secretary recommend that the President impose an additional tariff of 40 percent on the subject vanadium imports. In the alternative, Petitioners request that the Secretary recommend that the President impose a tariff rate quota ("TRQ") of 20 percent *ad valorem* tariff on imports up to an annual import volume ceiling and impose a 40 percent *ad valorem* tariff on imports above that threshold.

III. PETITIONERS

Founded in 1906 and based in Cambridge, Ohio, AMG manufactures and supplies products for the metals, manufacturing, refinery, defense, and petrochemical industries in North America and internationally. AMG converts hazardous oil refinery spent catalysts and power plant waste products into specialty metals used by steel producers for automotive, aerospace, oil and gas pipeline, defense, and infrastructure applications. AMG is the largest and lowest cost

producer of ferrovanadium (also referred to as "FeV") in the United States. AMG is also the largest recycler of spent oil refinery catalysts and power plant residues in the world. AMG's production of ferrovanadium uses a proprietary pyrometallurgical process that converts into saleable products 99 percent of all hazardous materials that would otherwise be destined for a landfill. AMG provides high quality ferrovanadium using state-of-the-art technology and proven expertise.

U.S. Vanadium recently acquired the production facilities in Hot Springs, Arkansas formerly owned by EVRAZ Stratcor ("Stratcor").[2] U.S. Vanadium is one of the world's leading producers and suppliers of vanadium oxides and vanadium chemicals used in the titanium alloy, steel, chemicals, petrochemicals, batteries, and turbine coatings industries. In particular, Stratcor produces the highest-purity vanadium pentoxide (also referred to as "V2O5") made anywhere in the world, and is a critical supplier of high purity vanadium oxides necessary for the production of titanium alloys for the aerospace industry. U.S. Vanadium produces its vanadium products from steel slag, ores, and other vanadium bearing materials.

IV. DOMESTIC PRODUCERS

In addition to Petitioners, the domestic vanadium industry includes several other companies that produce either ferrovanadium or vanadium pentoxide. Nearly all of the domestic vanadium producers have recently experienced some form of major operational difficulty, whether bankruptcy, plant closure, or idled operations.

[2] On October 13, 2019 U.S. Vanadium LLC ("US Vanadium") announced it had formally acquired the V2O5 production facility in Arkansas formerly owned by EVRAZ. U.S. Vanadium began toll-processing at the EVRAZ Stratcor facility in 2018. This petition will refer to "Stratcor" throughout when discussing the production facilities now owned by U.S. Vanadium.

With respect to ferrovanadium, Bear Metallurgical Company ("Bear"), in Butler, Pennsylvania, is the only other large volume domestic manufacturer. Bear generally manufactures ferrovanadium from vanadium pentoxide, either for a processing fee or under a toll production arrangement. In September 2016, Bear was acquired in a bankruptcy auction by Yilmaden Holding, Inc. Bear continued producing through bankruptcy, but as explained in more detail below, its production has declined significantly.

With respect to vanadium pentoxide, domestic manufacturers include Energy Fuels Inc. ("Energy Fuels") based in Lakewood, Colorado. Energy Fuels and Stratcor produced little or no vanadium pentoxide during 2017 and 2018, and only recently restarted their operations in late 2018.

Gulf Chemical and Metallurgical Company, another vanadium pentoxide producer, filed for bankruptcy in June 2016, resulting in its purchase by Gladieux Metals Recycling ("Gladieux") of Freeport, Texas. Gladieux is not currently operational, but it has expressed an interest in restarting its idled operations in 2020.[3]

[3] Additional information summarizing vanadium production and conversion in the United States is available at **Exhibit 1**.

V. IMPORTS TO BE INVESTIGATED

Vanadium is a naturally occurring element found as a component of certain minerals and as an impurity among hydrocarbons and bauxites. It occurs in many different minerals including patronite, vanadinite, carnotite, and bauxite, as well as in carbon containing deposits such as crude oil, coal, oil shale, and tar sands. In its pure form, vanadium is a grey, soft, ductile element that does not occur in native form. Vanadium's chemical element symbol is V, and its atomic number is 23.

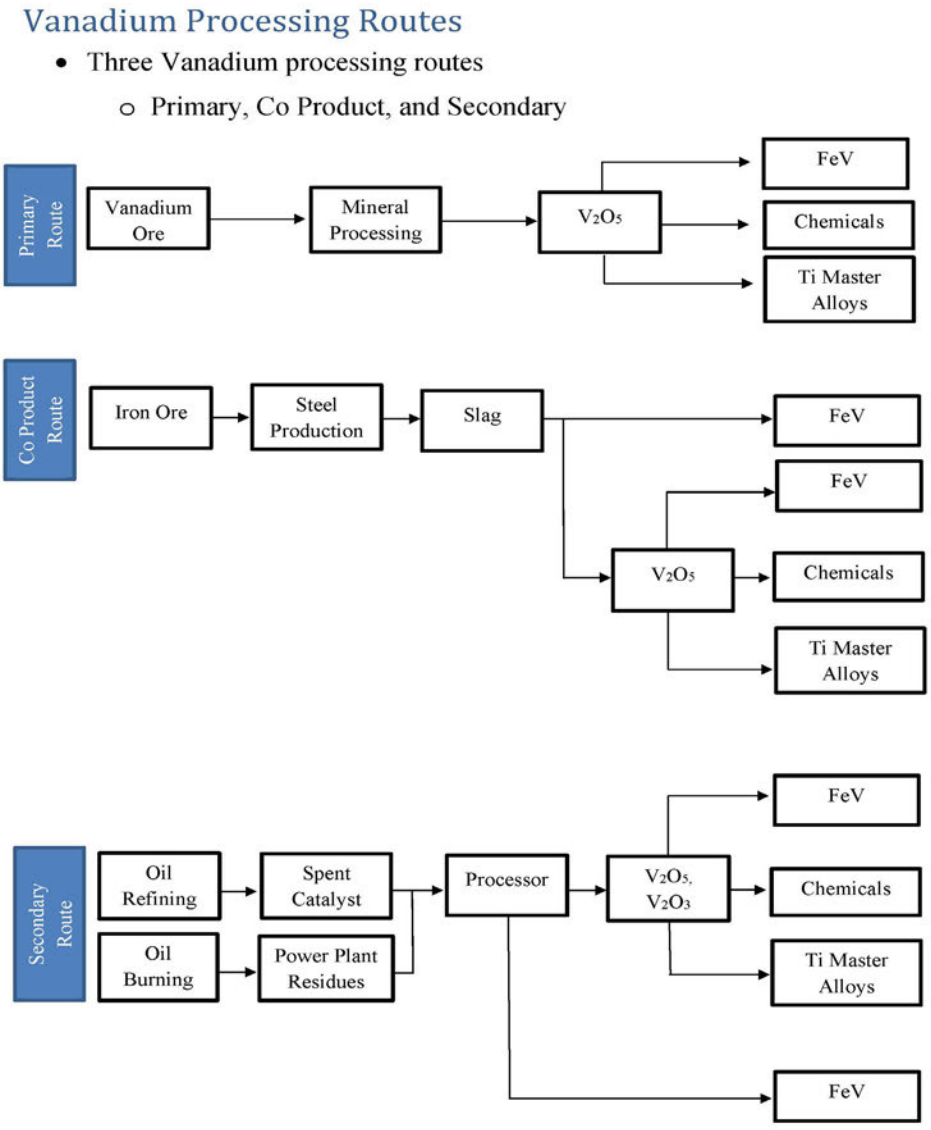
A. Scope Of Investigation

Petitioners request that the Secretary investigate imports of vanadium, including vanadium oxides (including vanadium pentoxide and vanadium trioxide), vanadium carbonitrides, ferrovanadium, and vanadates. These vanadium products are respectively classified under subheadings 2825.30.00, 2849.90.50, 7202.92.00, and 2841.90.00 of the HTSUS.[4] Vanadium carbonitrides also may be referred to as vanadium carbides or by a registered tradename such as Nitrovan®. Expressly excluded from the scope of this investigation are wrought and unwrought forms of vanadium classified under HTSUS subheadings 8112.99.20 and 8112.92.70.

B. Vanadium Production Process

Vanadium production takes three basic forms: (a) primary production from mining naturally occurring deposits, (b) co-production from slags, and (c) secondary production from residues and spent catalysts.

[4] As explained above, Petitioners provide the above 8-digit HTSUS item numbers with the understanding that all subsidiary 10-digit HTSUS item numbers within the 8-digit HTSUS subheading will also be included within the scope of this investigation.



Vanadiferous ores occur naturally and are characterized by low grades of contained vanadium. These naturally occurring vanadium ore deposits are located primarily in South Africa, Australia, Brazil, Russia, and China, and are mined through hard rock techniques. Vanadium in its raw form from mining of vanadiferous ores is produced on a small scale relative to the base metals and iron ore produced in the mining process. Primary production of vanadium

comes mainly from vanadium titanomagnetite ores, which are crushed, screened, ground, and magnetically separated at a low intensity to produce vanadium concentrates typically containing 1-2 percent vanadium pentoxide. In addition, vanadium can be produced directly from certain carbonaceous materials, including shale, oil sands, and some crude petroleum.

Vanadium produced as an extracted co-product of steel production accounts for the largest portion of total vanadium production, and vanadiferous slag from steelmaking represents the most significant source of the co-produced vanadium supply. In the steelmaking process, a vanadiferous slag of approximately 10-22 percent vanadium pentoxide is extracted from crude steel.

The third principal method of production is through the processing of various spent catalysts and carbonaceous waste streams. Vanadium occurs naturally in varying degrees and in small amounts in petroleum and coal. Refining petroleum that contains trace amounts of vanadium produces spent catalysts with significant concentrations of vanadium. Likewise, power generation plants that burn petroleum or coal that contain traces of vanadium produce residues with significant concentrations of vanadium. Spent catalysts and residues are then processed to recover the vanadium for steelmaking and other uses. The vanadium recovered in these processes may be ferrovanadium or vanadium pentoxide.

C. Uses Of Vanadium

Vanadium is used primarily to improve the strength, ductility, and weldability of steel used in a variety of industries. In particular, over 90 percent of global vanadium supplies are used to make a variety of different types of steels including high-strength low-alloy steel

("HSLA"), full alloy steel, carbon steel, and other steels.[5] Vanadium-alloyed steels are used in virtually every structural steel application in military equipment, and deliver light-weighting benefits when airlifting military equipment. Examples include "armor steel applications, combat vehicles, tactical vehicles, tactical bridges, material handling equipment, aircraft, watercraft, rail trailers, and steel structures."[6] Vanadium-alloyed steels are also used in mortar tubes, cannon tubes, and in howitzers,[7] as well as in blast resistant hardened structures. Vanadium is also used to make the HSLA steels used in infrastructure applications such as "auto parts, buildings, bridges, cranes, pipelines, rail cars, ships and truck bodies."[8] The vanadium consumed in steel is generally ferrovanadium but can also include vanadium carbonitrides.

The remaining less than 10 percent of vanadium is consumed in non-steel related applications such as titanium alloys and superalloys, which are made using vanadium pentoxide. Titanium alloys are used to manufacture "jet engine components, aircraft structures and vehicle armor."[9] Superalloys containing vanadium are used to manufacture jet engines,[10] and gas and

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[5] *See* Rhiannon Hoyle, *Vanadium Is Used to Strengthen Steel and China Can't Get Enough of It*, WALL STREET J. (Dec. 27, 2018), https://www.wsj.com/articles/chinese-demand-for-stronger-steel-makes-vanadium-a-hot-commodity-11545912002; *About Vanadium*, NEXTSOURCE MATERIALS, http://www.nextsourcematerials.com/vanadium/about-vanadium/ (last visited November 11, 2019); *About Vanadium*, LARGO RESOURCES, https://www.largoresources.com/company/about-vanadium/default.aspx (last visited November 11, 2019); *see also* ROSKILL, VANADIUM OUTLOOK TO 2028 (17th ed. 2019) at 3. (**Exhibit 2**).

[6] VANADIUM PRODUCERS & RECLAIMERS ASSOCIATION, 2017 VANADIUM USES, MILITARY RELEVANCE & SUPPLY THREATS IN THE U.S. (2017). (**Exhibit 3**).

[7] *Id.*

[8] U.S. GEOLOGICAL SURVEY, CRITICAL MINERAL RESOURCES OF THE UNITED STATES ECONOMIC AND ENVIRONMENTAL GEOLOGY AND PROSPECTS FOR FUTURE SUPPLY U2 (2017), *available at* https://pubs.er.usgs.gov/publication/pp1802U. (**Exhibit 4**).

[9] **Exhibit 3**.

steam turbines for electrical power generation.[11] Vanadium also has important applications in nuclear power generation,[12] and in batteries used in solar and wind power grids.[13] Vanadium redox batteries, in particular, store power from low-usage periods for use during peak demand periods.[14] These batteries can be charged and discharged inexhaustibly up to 20 years.[15] Unlike lithium-based batteries, vanadium redox batteries do not heat up when in use and can be charged and discharged simultaneously.[16] Additional information concerning the use of vanadium in critical infrastructure sectors is included in **Exhibit 10**. Specific national security related applications of vanadium are discussed in greater detail below in Section VII.

VI. LEGAL STANDARD

Section 232 authorizes the Secretary to initiate an investigation to determine the effect that imports of an article may have on the national security of the United States. The Secretary

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[10] U.S. GEOLOGICAL SURVEY, DRAFT CRITICAL MINERAL LIST 3, Table 1 (2018), *available at* https://pubs.usgs.gov/of/2018/1021/ofr20181021.pdf. (**Exhibit 5**).

[11] Art Kracke, *Superalloys, The Most Successful Alloy System of Modern Times – Past, Present and Future*, 7TH INT'L SYMPOSIUM ON SUPERALLOY 718 & DERIVATIVES 40 (2010), *available at* https://www.tms.org/superalloys/10.7449/2010/Superalloys_2010_13_50.pdf. (**Exhibit 6**).

[12] *It's Elemental, The Element Vanadium*, JEFFERSON LAB, https://education.jlab.org/itselemental/ele023.html. (**Exhibit 7**).

[13] *Vanadium: The World's Critical Element Fueling a Major Trade War*, CISION PR NEWSWIRE (Oct. 30, 2018), https://www.prnewswire.com/news-releases/vanadium-the-world-s-critical-element-fueling-a-major-trade-war-824903145.html. (**Exhibit 8**).

[14] *Id.*

[15] *Vanadium is the latest beneficiary of the battery craze*, THE ECONOMIST (June 21, 2018), https://www.economist.com/business/2018/07/21/vanadium-is-the-latest-beneficiary-of-the-battery-craze. (**Exhibit 9)**.

[16] **Exhibit 8**.

shall conduct an investigation if requested by the head of any department or agency, upon application of an interested party, or upon the Secretary's own initiative.[17]

Section 232 requires the Secretary to advise the President if an article "is being imported into the United States in such quantities or under such circumstances as to threaten to impair the national security."[18] The Secretary is also directed to submit a report to the President with recommendations for "action or inaction under this section."[19]

Section 232(d) directs the Secretary and the President to give consideration to the domestic production needed for projected national defense requirements and the capacity of the United States to meet national security requirements. Although Section 232 does not define "national security" *per se*, it does present a non-exclusive list of factors to be considered in evaluating the effects of the imports on national security.[20]

Section 232(d) also directs the Secretary and the President to "recognize the close relation of the economic welfare of the Nation to our national security, and take into consideration the impact of foreign competition on the economic welfare of individual domestic industries" by examining whether any substantial unemployment, decrease in revenues of government, loss of skills or investment, or other serious effects resulting from the displacement of any domestic products by excessive imports, or other factors, result in a "weakening of our internal economy" that may impair the national security.[21]

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[17] *See* 19 U.S.C. § 1862(b)(1)(A).

[18] *See* 19 U.S.C. § 1862(b)(3)(A).

[19] *Id*.

[20] *See* 19 U.S.C. § 1862(d).

[21] *Id*.

In recent Section 232 reports, the Secretary has determined that "national security" for purposes of the statute includes the "general security and welfare of certain industries, beyond those necessary to satisfy national defense requirements, which are critical to minimum operations of the economy and government."[22]

The applicable regulations[23] also describe the relevant inquiry under Section 232:

> (a) To determine the effect on the national security of the imports of the article under investigation, the Department shall consider the quantity of the article in question or other circumstances related to its import. With regard for the requirements of national security, the Department shall also consider the following:
>
> Domestic production needed for projected national defense requirements;
>
> (1) The capacity of domestic industries to meet projected national defense requirements;
>
> (2) The existing and anticipated availabilities of human resources, products, raw materials, production equipment and facilities, and other supplies and services essential to the national defense;
>
> (3) The growth requirements of domestic industries to meet national defense requirements and the supplies and services including the investment, exploration and development necessary to assure such growth; and
>
> (4) Any other relevant factors.

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[22] U.S. DEPT. OF COMMERCE, BUREAU OF EXPORT ADMINISTRATION, THE EFFECT OF IMPORTS OF IRON ORE AND SEMI-FINISHED STEEL ON THE NATIONAL SECURITY 5 (Oct. 2001); U.S. DEPT. OF COMMERCE, BUREAU OF INDUSTRY AND SECURITY, THE EFFECT OF IMPORTS OF STEEL ON THE NATIONAL SECURITY 1 (Jan. 2019) ("Steel 232 Report"); U.S. DEPT. OF COMMERCE, BUREAU OF INDUSTRY AND SECURITY, THE EFFECT OF IMPORTS OF ALUMINUM ON THE NATIONAL SECURITY 1 (Jan. 2019) ("Aluminum 232 Report").

[23] 15 C.F.R. § 704.

(b) In recognition of the close relation between the strength of our national economy and the capacity of the United States to meet national security requirements, the Department shall also, with regard for the quantity, availability, character and uses of the imported article under investigation, consider the following:

(1) The impact of foreign competition on the economic welfare of any domestic industry essential to our national security;

(2) The displacement of any domestic products causing substantial unemployment, decrease in the revenues of government, loss of investment or specialized skills and productive capacity, or other serious effects; and

(3) Any other relevant factors that are causing or will cause a weakening of our national economy.

VII. VANADIUM IS ESSENTIAL TO U.S. NATIONAL SECURITY

Vanadium has been recognized in various ways and by various government agencies as critical or essential to the national and economic security of the United States. The analyses and reports described below demonstrate the broad recognition that the U.S. industry producing vanadium is vitally important but vulnerable, particularly in light of a large and growing volume of imports.

A. The U.S. Government Has Repeatedly Designated Vanadium As A "Critical" And "Strategic" Material That Is Essential To The National Security

Both the Executive and Legislative Branches of the U.S. Government have designated vanadium as a critical mineral that is essential to U.S. national security.

1. Executive Order 13806

In Executive Order 13806, titled *Assessing And Strengthening The Manufacturing and Defense Industry Industrial Base And Supply Chain Resiliency Of The United States*, the President made clear that a "healthy manufacturing and defense industrial base and resilient

supply chains are essential to the economic strength and national security of the United States."[24] As directed by Executive Order 13806, an interagency task force led by the U.S. Department of Defense reported to the President on the U.S. manufacturing capacity, the defense industrial base, and supply chain resiliency. One of the primary recommendations of that report was "diversifying away from complete dependency upon sources of supply in politically unstable countries . . . ." [25]

2. Executive Order 13817 and the designation of vanadium as a "critical mineral"

From these general statements of policy, other analyses have delved deeper into specific materials and their impact on the national and economic security of the United States. Executive Order 13817, titled *A Federal Strategy To Ensure Secure And Reliable Supplies Of Critical Minerals*, noted the United States' reliance on imports of certain minerals "that are vital to the Nation's security and economic prosperity" and directed the Secretary of the Interior to publish a list of "critical minerals." The Executive Order defined "critical mineral" as:

> (i) a non-fuel mineral or mineral material essential to the economic and national security of the United States, (ii) the supply chain of which is vulnerable to disruption, and (iii) that serves an essential function in the manufacturing of a product, the absence of which would have significant consequences for our economy or our national security.[26]

The U.S. Department of the Interior then determined that vanadium is a "critical mineral."[27] This designation came after an extensive process of consultation with the

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[24] Exec. Order No. 13806 § 1, 82 Fed. Reg. 34597 (Jul. 21, 2017).

[25] *Id*.

[26] Exec. Order No. 13817 §§ 1-2, 82 Fed. Reg. 60835 (emphasis added).

[27] 83 Fed. Reg. 23295 (May 18, 2018).

Department of Defense, the U.S. Geological Survey ("USGS"), and the Bureau of Land Management. The process also included other federal agencies through the White House Office of Science and Technology Policy's National Science and Technology Council Subcommittee on Critical and Strategic Mineral Supply Chains,[28] and hundreds of written comments from interested parties.[29]

The USGS determined that, although "substantial domestic resources exist," there is no primary production of vanadium in the United States and "U.S. import reliance . . . is high." [30] In fact, the USGS reports that the U.S. net import reliance regarding vanadium produced via primary production is 100 percent.[31]

Also pursuant to Executive Order 13817, the U.S. Department of Commerce, in cooperation with multiple other agencies, submitted a report to the President on a strategy to reduce the United States' reliance on the critical minerals identified by the Department of the Interior. That report, *A Federal Strategy to Ensure Secure and Reliable Supplies of Critical Minerals*, made clear that "assured supply of critical minerals {as defined} and the resiliency of their supply chains are essential to the economic prosperity and national defense" of the United

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[28] NATIONAL SCIENCE AND TECHNOLOGY COUNCIL SUBCOMMITTEE ON CRITICAL AND STRATEGIC MINERAL SUPPLY CHAINS, ASSESSMENT OF CRITICAL MINERALS: UPDATED APPLICATION OF SCREENING METHODOLOGY (Feb. 2018), *available at* https://www.whitehouse.gov/wp-content/uploads/2018/02/Assessment-of-Critical-Minerals-Update-2018.pdf. (**Exhibit 11**).

[29] 83 Fed. Reg. 23295 (May 18, 2018).

[30] **Exhibit 5** at 15.

[31] U.S. GEOLOGICAL SURVEY, *2018 Net Import Reliance*, https://www.usgs.gov/media/images/2018-us-net-import-reliance. (**Exhibit 12**).

States.[32] The report also noted that mitigating the risks of dependence on foreign supply chains "is important . . . to promote American prosperity and to preserve peace through strength."[33] The report also highlighted the lack of domestic production capacity of these critical minerals and the resultant vulnerability to actions by foreign governments that could lead to price, demand, and supply volatility.[34] The report also identified 24 goals and 61 recommendations for action to assure supplies of these critical minerals. In particular, the report recommended that a number of policies be assessed to incentivize U.S. private industry to invest in production and processing capabilities and to strengthen government sourcing requirements.[35] Notably, in discussing international trade concerns, the report recommended consideration of the circumstances of reliance on imports to determine the effect on national security.[36]

3. The Strategic And Critical Materials Stockpiling Act and the designation of vanadium as a "strategic material"

The Strategic And Critical Materials Stockpiling Act defines "strategic and critical materials" as materials that (a) "would be needed to supply the military, industrial, and essential civilian needs of the United States during a national emergency" and (b) "are not found or produced in the United States in sufficient quantities to meet such need."[37] The Defense

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[32] U.S. DEPT. OF COMMERCE, A FEDERAL STRATEGY TO ENSURE SECURE AND RELIABLE SUPPLIES OF CRITICAL MINERALS 3 (June 4, 2019), *available at* https://www.commerce.gov/news/reports/2019/06/federal-strategy-ensure-secure-and-reliable-supplies-critical-minerals.

[33] *Id*.

[34] *Id*. at 9.

[35] *Id*. at 25.

[36] *Id*. at 30.

[37] 50 U.S.C. § 98(h)(3).

Logistics Agency of the U.S. Department of Defense lists vanadium on its website as a "strategic material" and notes a number of the important uses of vanadium in steelmaking, in titanium-aluminum-vanadium alloys for jet engines, in cladding titanium to steel, and energy storage.[38]

4. The Foreign Investment Risk Review Modernization Act and the designation of vanadium-reliant technologies as "critical technologies"

When Congress revised the law governing the review of foreign investments in the United States, the U.S. Department of the Treasury promptly designated certain technologies as "critical," and a number of those critical technologies rely upon vanadium as a vital input. The Foreign Investment Risk Review Modernization Act of 2018 ("FIRRMA") broadened the authorities of the President and the Committee on Foreign Investment in the United States ("CFIUS") and authorized the creation of certain pilot programs. FIRRMA became effective August 18, 2018, and Treasury published a notice on October 11, 2018 – exceedingly quickly for a federal agency – designating certain "critical technologies" in industries "in which the threat of erosion of technological superiority . . . requires immediate action."[39] Waiving the public comment requirement because of urgent and compelling circumstances, Treasury established mandatory declarations for certain transactions involving the designated critical technologies.[40] Among the industries employing these critical technologies are several that rely upon vanadium as a vital input, including aircraft manufacturing; aircraft engine and engine parts manufacturing; military armored vehicle, tank and tank component manufacturing; and storage battery manufacturing. These vanadium-consuming technologies were understood to be critical to

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[38] U.S. DEFENSE LOGISTICS AGENCY, *Strategic Materials*, https://www.dla.mil/HQ/Acquisition/StrategicMaterials/Materials/. (**Exhibit 13**).

[39] 83 Fed. Reg. 51324 (Oct. 11, 2018).

[40] *Id*.

United States technological superiority and so required prompt designation by the Department of the Treasury.

5. The Department of Homeland Security's designation of vanadium-reliant industries as "critical infrastructure sectors"

The U.S. Department of Homeland Security has designated 16 Critical Infrastructure Sectors "whose assets, systems, and networks . . . are considered so vital to the United States that their incapacitation would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof."[41] These Critical Infrastructure Sectors include the Critical Manufacturing Sector (including primary metals, machinery, and transportation) and the Defense Industrial Base Sector (including aircraft, combat vehicles, and armor). Vanadium is a vital input in each of these industrial sectors and subsectors.

6. Congressional creation, and Defense Department implementation, of the Vanadium Technology Program

The U.S. Congress also expressly has recognized the importance of vanadium to the economic and national security of the United States. This recognition was exemplified by the creation of the Vanadium Technology Program ("VTP") in 2002, which was implemented by the Department of Defense. The VTP "funds the research, development and prototype testing necessary to implement vanadium alloyed steel into warfighter protection and mobility."[42] Noting vanadium's utility and the fact that it "is used in virtually every structural application in the military,"[43] Congress appropriated between two and five million dollars each year from 2002

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[41] U.S. DEPT. OF HOMELAND SECURITY, *Critical Infrastructure Sectors*, https://www.dhs.gov/cisa/critical-infrastructure-sectors. (**Exhibit 14**).

[42] 155 CONG. REC. E2066 (Jul. 29, 2009), *available at* https://www.congress.gov/crec/2009/07/29/CREC-2009-07-29-pt1-PgE2066.pdf. (**Exhibit 15**).

[43] Press Release, Senator Mark Pryor (Dec. 22, 2005), *available at* https://web.stanford.edu/~jgrimmer/Website/Joint/File832.txt. (**Exhibit 16**).

to 2010 to fund the program, which concluded in 2013.[44] Congress continued to fund, and the Department of Defense continued to implement, the VTP during this period because the vanadium related research was critical to the advancement of the U.S. military. For example, with funds from the VTP, the Advanced Technology Institute ("ATI") researched the benefits of vanadium alloying in Army support structures, bridges, vehicles, barriers, and buildings.[45] Notably, this research resulted in reductions in weight and costs of critical support structures, blast resistant hardened structures, light-weighting that enhances the transport of military equipment, a longer span temporary bridge, and lighter trusses and joists.[46] VTP funded research has also allowed the Army to develop lighter mobile systems, which improve airlift capability.[47] The VTP is one example of the major role vanadium plays in the development of defense technology and therefore, the promotion of U.S. national security.

In light of the determinations, analyses, and reports described above, there can be no doubt that vanadium is important to the national and economic security of the United States.

B. Domestic Vanadium Production Is Essential For National Security Applications

As discussed above, vanadium has been repeatedly and consistently designated by the U.S. government as a "critical" and "strategic" material. Because vanadium is used principally

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[44] H.R. REP. NO. 107-298, at 168 (2002), *available at* https://www.congress.gov/107/crpt/hrpt298/CRPT-107hrpt298.pdf (**Exhibit 17**); H.R. REP. NO. 111-230, at 425, *available at* https://www.congress.gov/111/crpt/hrpt230/CRPT-111hrpt230.pdf. (**Exhibit 18**).

[45] Press Release, Charleston Regional Development Alliance, "SCRA's ATI Announces Vanadium Safety Readiness Program for U.S. Army," *available at* https://www.crda.org/news/local_news/scras-ati-announces-vanadium-safety-readiness-program-for-us-army/. (**Exhibit 19**).

[46] **Exhibit 15** at 1.

[47] **Exhibit 16**.

in the production of high-strength metal alloys, including those used in aerospace, infrastructure, defense, and energy applications, it is therefore essential to U.S. national security applications, both for national defense and critical infrastructure purposes.

1. Vanadium is essential for national defense requirements

Vanadium is essential to the national defense due to its widespread use in strengthening metal alloys. In particular, vanadium is used to strengthen steel items used in a variety of military applications. In its Steel 232 Report issued in 2018, this Department found that "steel articles are critical to the nation's overall defense objectives."[48] This Department also explained that "[t]he U.S. Department of Defense (DoD) has a large and ongoing need for a range of steel products that are used in fabricating weapons and related systems for the nation's defense."[49] Specific military applications include military-grade AH36, AH32, and MIL22698 steels used to build U.S. Naval aircraft carriers and submarines,[50] and steels used in the forging of mortar and artillery shells. Given that vanadium is integral to military grade steels used in these applications, vanadium is by definition also critical or essential to the nation's overall defense objectives.

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[48] Steel 232 Report, *supra* n. 22 at 23.

[49] *Id*. (citing AMERICAN IRON & STEEL INSTITUTE, AISI PUBLIC POLICY PRIORITIES – PROMOTING A PRO-MANUFACTURING AGENDA (Feb. 2, 2017), http://www.steel.org/~/media/Files/AISI/Reports/AISI-2017-Public-Policy-Agenda.pdf?la=en). (**Exhibit 20**).

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The U.S. Geological Survey has also characterized vanadium as "irreplaceable" for its role in aerospace applications.[51] Vanadium-titanium alloys have, "the best strength-to-weight ratio of any engineered material yet discovered."[52] These alloys are more stable than other alloys, and are well suited for jet engines, high-speed airframes, and other aircraft components.[53] For example, vanadium alloys are also used in aircraft hydraulic systems, jet engine components, aerospace engine gas turbines, and aircraft wheel bolts. Because "no acceptable substitutes exist" for vanadium in aerospace titanium alloys, vanadium is essential not only for military aircraft, but also for ballistic missiles.[54]

In addition, the U.S. Department of Defense has invested critical funds in a variety of experimental applications of vanadium, which signals the strategic significance of vanadium. For example, beginning in 2014, the U.S. Navy partnered with the California Energy Commission to deploy a Smart Microgrid project using vanadium-flow batteries to optimize power consumption and storage on military bases.[55] The Defense Advanced Research Projects Agency and the Air Force Office of Scientific Research have also partnered with researchers at the Harvard School of Engineering and Applied Sciences and at the University of California at San Diego to develop a device comprised of vanadium dioxide on a sheet of sapphire which can

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[51] **Exhibit 4** at U-2.

[52] *Id*.

[53] *Id*.

[54] *See generally* WILLIAM A. GOOCH, U.S. ARMY RESEARCH LABORATORY, THE DESIGN AND APPLICATION OF TITANIUM ALLOYS TO U.S. ARMY PLATFORMS-2010, *available at* https://cdn.ymaws.com/titanium.org/resource/resmgr/2010_2014_papers/GoochWilliam_2010_MilitaryGr.pdf. (**Exhibit 21**).

[55] Andrew Burger, *New Navy Smart Microgrid Project Will Test Vanadium Flow Battery Storage*, RENEWABLE ENERGY WORLD (Dec. 2, 2014). (**Exhibit 22**).

hide from infrared cameras.[56] Together, these investments in experimental applications of vanadium demonstrate that in addition to structural and mechanical applications of vanadium, vanadium will also serve as a critical input in future technologies relied on by the U.S. military.

2. Vanadium is essential to U.S. critical infrastructure

As described above, vanadium is used in a variety of infrastructure sectors deemed critical by the U.S. Government. These sectors have been deemed "critical" by the U.S. Government because their "assets, systems, and networks, whether physical or virtual, are considered so vital to the United States that their incapacitation or destruction would have a debilitating effect on security, national economic security, national public health or safety, or any combination thereof."[57] Some examples of critical infrastructure applications that contain vanadium include reinforcing bar used for buildings and bridges; oil and gas pipelines; structural steels used in chemical plants and office buildings; Hadfield steels used in railway cars, and other steels used in railway applications; transportation and construction machinery of all types; turbines; and chemical applications. Vanadium therefore is necessary to build, maintain, and support U.S. critical infrastructure that is vital both to the economic and national security of the United States.

VIII. IMPORTS ADVERSELY IMPACT THE ECONOMIC WELFARE OF THE U.S. VANADIUM INDUSTRY

Imports threaten the continued viability of the U.S. vanadium industry. The United States is heavily reliant on vanadium imports, which poses risks for supply disruptions. Import

[56] Press Release, Harvard John A. Paulson School of Engineering and Applied Sciences, "New device hides, on cue, from infrared cameras," (Nov. 26, 2012), *available at* https://www.seas.harvard.edu/news/2012/11/new-device-hides-cue-infrared-cameras. (**Exhibit 23**).

[57] **Exhibit 14**.

prices undercut U.S. prices and vary dramatically in the short term. This creates uncertainty in the domestic market, which in turn inhibits planning for technology investment, research and development, and capacity expansion necessary to sustain this critical domestic industry and to provide a significant portion of domestic demand. As a result, imports threaten U.S. national security.

A. Import Volume Trends And Other Factors Demonstrate The Adverse Circumstances Facing The U.S. Vanadium Industry

Vanadium imports have had a long-term devastating impact on the development of the U.S. vanadium industry. Over the past 25 years, U.S. producers of ferrovanadium have proven to have been injured repeatedly by unfairly traded imports from multiple sources. Although U.S. producers of ferrovanadium have successfully defended against some unfairly traded imports in domestic trade remedy proceedings, new foreign exporters continued to emerge and dump ferrovanadium into the U.S. market. In 1995, for example, the domestic industry was found to be injured by dumped ferrovanadium and nitrided vanadium from Russia.[58] In that investigation, the United States International Trade Commission ("ITC") found that the volume of subject imports significantly outpaced the rate of the overall increase in domestic consumption, expanding the Russian market share at the expense of the domestic industry.[59] The ITC also found that Russian ferrovanadium imports suppressed and depressed prices in the domestic market to a significant degree.[60] The ITC stated that Russian imports caused declines in many of the key domestic industry indicators, including shipments, employment, sales revenues, and

[58] *See* USITC Pub. 2904 (June 1995).

[59] *Id.* at I-17.

[60] *Id.* at I-18-I-19.

market share, and prevented the domestic industry from taking full advantage of the expanding U.S. market and declining costs.[61]

Later, the domestic industry in 2003 was found to be injured by dumped ferrovanadium from China and South Africa.[62] In that proceeding, subject imports had increased 52 percent which caused the domestic industry to file the petition.[63] The ITC found that subject imports depressed domestic prices to a significant degree, and that subject imports increased market share at the expense of the domestic industry, even while domestic producers themselves reduced prices in an unsuccessful effort to retain market share.[64] Ultimately, the ITC also found that significant increases in volume and market share of subject merchandise had a significant depressing effect on domestic prices and had a significant adverse impact on the domestic industry.

Most recently, the domestic industry was found to be injured in 2017 by dumped ferrovanadium from Korea.[65] In that proceeding subject imports had increased by 106 percent during the investigation period,[66] and underselling was found in over 70 percent of the quarters examined.[67] In addition, the increasing volume of imports at declining prices resulted in downward price adjustments on 25 separate occasions with the published price for December

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[61] *Id.* at I-21.

[62] *See* USTIC Pub. 3570 (Jan. 2003).

[63] *Id.* at 17.

[64] *Id.* at 19.

[65] *See* USITC Pub. 4683 (May 2017).

[66] *Id.* at 16.

[67] *Id.* at 17.

2015 being less than half the corresponding price in 2014.[68] As a result, the ITC found that the increasing volumes of subject imports depressed prices in the United States as demand for ferrovanadium was declining, significantly and adversely affecting the domestic industry's revenues and financial performance.[69] These ongoing unfair trade practices have grossly inhibited the growth of the U.S. vanadium industry, which in turn threatens the U.S. critical infrastructure sector and the U.S. defense industrial base.

The U.S. ferrovanadium industry also has had to endure the adverse consequences that occurred after the Evraz Group ("Evraz"), a major foreign ferrovanadium manufacturer, made claims to the U.S. Government that did not evolve as represented. Evraz has the ability to export ferrovanadium to the United States from its manufacturing locations in Russia (Evraz Vanady Tula) and Europe (Evraz Nikom, located in the Czech Republic). Evraz Nikom manufactures ferrovanadium from Russian-sourced vanadium oxide produced by Evraz Vanady Tula.[70] In August 2012, as part of its efforts to sunset the Russian antidumping duty order, Evraz asserted to the ITC that its exports from Russia and its European subsidiary would not further expand into the U.S. market because it was "operating at high levels of capacity utilization, and that it is no longer export-oriented."[71] Relying upon Evraz's claims, the ITC sunsetted the Russian ferrovanadium order by concluding that the volume of exports from its Russian and European operations were essentially capped insofar as any increase in U.S. imports from Russia "would likely be balanced by corresponding decline in import volume" from Evraz's European

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[68] *Id.* at 18.

[69] *Id.* at 22.

[70] *See* Evraz Nikom, http://vanadium.evraz.com/facilities/evraz-nikom/. (**Exhibit 24**).

[71] USITC Pub. 4345 (Aug. 2012) at 11, 12, 15.

operations.[72] At the time, Evraz's 2011 annual exports of ferrovanadium to the United States (including its direct exports from Russia and indirect exports from its Czech Republic operations) stood at 0.4 million pounds[73] and were valued at $5.1 million.[74] By 2014, approximately two years after the Russian order was sunsetted, Evraz's exports to the United States of ferrovanadium from Russia and the Czech Republic had grown to 3.8 million pounds of contained vanadium valued at $41 million, representing a 950 percent increase in volume.[75]

Despite the initiation of the Korean ferrovanadium investigation, U.S. vanadium imports of the products proposed to be under investigation continue to increase. Between 2016 and 2018, annual vanadium imports increased 31 percent from 16,964,648 pounds to 22,243,211 pounds.[76] The increased imports impede meaningful development of the U.S. vanadium industry.

The U.S. vanadium industry suffers from high and increasing import penetration.[77] With respect to vanadium consumed in steel applications (*i.e.*, ferrovanadium and vanadium carbonitrides), import penetration has been steadily rising over the last few years from 52 percent

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[72] *Id*. at 19.

[73] When used throughout this petition, "pounds of vanadium" refers to the contained weight of vanadium.

[74] *Id*. at IV-1-2.

[75] *See id*. at IV-2-3 identifying 2011 ferrovanadium import levels from Russia and the Czech Republic. *See also*, 2014 Russian and Czech Republic ferrovanadium imports levels as published by U.S. ITC Dataweb. (**Exhibit 25)**. Note, August 2014 Czech Republic per-unit import amounts were used to derive the September through December 2014 Czech Republic import quantities.

[76] *See* Vanadium Import Statistics. (**Exhibit 26**). Contained vanadium volume amounts are used instead of the total import volume which would include volume amounts attributed to impurities.

[77] Import penetration is defined as the ratio of imports divided by apparent domestic consumption.

in 2016 to 61 percent in 2018.[78] Import penetration is projected to increase to 67 percent in 2019.[79] The import penetration ratios would increase further when also factoring in imports of vanadium oxides, as there has been limited production of these products in the United States during the 2016-2018 period, and only modest amounts of production are projected for 2019. Specifically, industry sources estimate 2019 production for Energy Fuels and Stratcor (the U.S. producers of vanadium pentoxide identified above) at [ ] pounds of vanadium compared to a total projected import volume of 9,113,963 pounds of vanadium oxides.[80]

The underselling of imported vanadium has impacted domestic prices and industry profitability. [

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The U.S. vanadium industry also suffers from a high import-to-export ratio. For ferrovanadium and vanadium carbonitride products, between 2016 and data available for 2019, imports exceeded exports by factors ranging from 9 to 22.[82] Similarly, these factors would only increase when including vanadium oxides.

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[78] *See* Estimated Apparent U.S. Ferrovanadium Market. (**Exhibit 27**).

[79] *Id.*

[80] *See* Estimated Global Vanadium Production. (**Exhibit 28**); **Exhibit 26 and Exhibit 1**.

[81] *See* **Exhibit 29**. Ferrovanadium is commonly produced in two different grades (40-60 percent or 75-85 percent), however both grades are chemically interchangeable. Vanadium preferences are therefore not dictated by grade because most steelmakers possess the technical capability to adjust steelmaking processes to accommodate different grades of ferrovanadium. As a result, the above analysis, which uses vanadium content quantity to derive the per-unit price, accounts for any potential difference in grade.

[82] *See* **Exhibit 27**.

A comprehensive response to the effects of imports threatening the national security is vital to sustaining domestic production of vanadium. As the history of trade remedy cases presented above demonstrates, efforts by the domestic industry to defend itself have continued over many years with some success but the source of unfairly traded imports continues to shift. It is both unrealistic and financially impossible for the domestic vanadium industry to rely on a continuous series of rifle-shot legal actions when such measures eventually are of limited effect in controlling unfairly traded imports from new sources. International market distortions in the vanadium market cannot be resolved by U.S. trade actions that affect one or a few exporting countries. A comprehensive response is both warranted and required to provide market certainty in the United States in order for a viable U.S. vanadium industry to develop and sustain itself.

B. U.S. Vanadium Producers Are At A Competitive Disadvantage Relative To Foreign Vanadium Producers

1. Environmental and safety regulations are more costly in the United States

Environmental and Safety Regulations – United States

Vanadium producers in the United States must comply with stringent environmental and safety regulations, which increase costs and weaken domestic producers' ability to compete with foreign producers. For example, domestic vanadium producers that recycle vanadium-bearing spent catalysts, an Environmental Protection Agency ("EPA")-listed hazardous waste,[83] must comply with myriad standards, including the Resource Conservation Recovery Act ("RCRA"), the Clean Air Act ("CAA"), Clean Water Act ("CWA") including but not limited to National Pollutant Discharge Elimination System ("NPDES"), and other EPA and Occupational Safety and Health Administration ("OSHA") regulations. Moreover, as recyclers of hazardous waste,

[83] 40 C.F.R. § 261.32 (2018).

vanadium producers may also be governed by standards applicable to generators, transporters, and owners of storage facilities for hazardous waste, along with additional and more stringent standards imposed by the state in which they operate.[84]

The regulation of storage of hazardous wastes alone involves hundreds of provisions ranging from general facility standards, to air emission standards, to required equipment, to conditions of containers. For example, nearly 50 EPA regulations are devoted to setting air emissions standards for vanadium production facilities, governing the gear to be used for the ventilation system, compressors, pressure relief devices, and related equipment.[85] Even producers that do not store the spent catalyst before recycling have rigorous protocols regarding the maintenance of their facility, equipment, and ground water monitoring.[86] If a producer transports the hazardous waste, they are subject not only to EPA regulations, but to Department of Transportation ("DOT") regulations as well, which govern ventilation, loading, and spills.[87] All generators, transporters, and recyclers of hazardous wastes must also regularly notify the EPA of their activities to ensure compliance.[88] The specialized equipment, regular monitoring, and facility requirements considerably drive up the costs associated with domestic vanadium production.

Vanadium producers also must comply with the rigorous requirements of the CAA which regulates the emission of air pollutants. Those CAA requirements include installation and

[84] 40 C.F.R. § 261.1 (2018).

[85] 40 C.F.R. § 264.1030–.1091 (2018).

[86] 40 C.F.R. § 265.1–.1090 (2018).

[87] 49 C.F.R. § 171 (2018).

[88] 42 U.S.C. § 6930 (2018).

operation of expensive air pollutant control equipment as well as stringent monitoring, recordkeeping and reporting, all of which are implemented through federal and state CAA permitting.

Vanadium producers are also regulated by CWA NPDES permitting requirements. The permit limits the content and amount of pollutants that can be discharged from any facility, adding another layer of specialized equipment, monitoring, and reporting.

Finally, vanadium producers must also comply with all OSHA General Industry regulations, and must follow the specific OSHA standards related to hazardous waste. These standards include requirements for personal protective equipment, respiratory protection, sanitation, and fire protection.[89]

Environmental and Safety Regulations – U.S. Competitors

The disparity between the U.S. regulatory framework and that of its competitors is stark, with vast differences in production costs placing U.S. producers at a competitive disadvantage. Vanadium regulation in competing countries is relatively limited compared to the robust regulatory framework in the United States. Vanadium in top exporting countries, like Russia, China, and South Africa, is produced in significant quantities through mining, and the environmental and safety regulations are limited to basic issues such as groundwater, waste, emissions, and miner safety. For example, under the 1992 Russian Subsoil Law, Russian mines are only required to conduct an environmental impact assessment, apply for a permit, and

[89] 29 C.F.R. § 1910 (2018).

prevent the accumulation of waste in places that could affect drinking water. Despite these requirements, many mines disregard pollution impacts due to lack of oversight and monitoring.[90]

China, the world's largest vanadium producer, similarly requires mining companies to conduct an environmental impact assessment and comply with certain mining safety regulations.[91] Chinese regulations, however, tend to express goals rather than mandates, resulting in limited enforcement action and freeing Chinese vanadium producers from purchasing special equipment, maintaining facility standards, and controlling emissions.[92] Ultimately, the disparity in regulatory environments places U.S. vanadium producers at a competitive disadvantage relative to foreign competitors.

Even European producers of ferrovanadium, though subject to somewhat more stringent regulation than Russian or Chinese producers, benefit significantly from differences between the U.S. and European legal regimes. First, ferrovanadium producers in the EU, particularly in Eastern Europe, face substantially lower environmental controls in their production of ferrovanadium, which places them at a competitive advantage relative to U.S. producers.[93]

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[90] Kristina Soderholm et al*., Environmental Regulation and Competitiveness in the Mining Industry*, 43 RESOURCES POLICY 130, 136–38 (2015). (**Exhibit 30**).

[91] Guhua Wu et al., *Mining in China: Overview*, THOMAS REUTERS PRACTICAL LAW (2018), https://uk.practicallaw.thomsonreuters.com/w-011-1348?transitionType=Default&contextData=(sc.Default)&firstPage=true&bhcp=1. (**Exhibit 31**).

[92] Christine Fazio & Ethan Strell, *Comparing and Contrasting U.S. and Chinese Environmental Law*, 247 N.Y.L.J. 3 (2012), https://global-factiva-com.ezp-prod1.hul.harvard.edu/ga/default.aspx. (**Exhibit 32**).

[93] For example, AMG has plans to expand its domestic vanadium production capacity through the construction of a new vanadium production facility. AMG's engineering group estimated that [ ] percent of the cost of its new capacity expansion will be associated with environmental equipment and related activities. During the operation of the new facility, a large proportion of the total electricity consumed will be to operate the environmental protection equipment. AMG believes that foreign producers of ferrovanadium are not similarly subject to this high proportion of costs for environmental controls.

Latvia-based SIA Ferrolat ("Ferrolat"), for example, is a relatively new entrant in the global ferrovanadium market, with exports to the U.S. appearing for the first time in 2017.[94] Petitioners believe that this company, among others in Europe, is subject to less stringent emission control standards than U.S. manufacturers, and therefore, has not invested in the costly air pollution equipment that is required in the United States. Ferrolat has used this unfair cost advantage to sell its ferrovanadium products in the United States at very low prices. During 2018, the average unit value ("AUV") for ferrovanadium from Latvia ($22.79 per pound of contained vanadium) was 21.6 percent less than the estimated AUV for imports from all other countries ($29.08 per pound contained vanadium).[95] Averages, of course, can mask the true market impact of fluctuating prices and especially of extremely low comparative prices. In November 2018, the Latvian ferrovanadium AUV ($18.79 per pound contained vanadium) was 48.8 percent less than the estimated import ferrovanadium AUV from all other countries ($36.68 per pound of contained vanadium).[96] With a limited number of global manufacturers, Latvian-sourced ferrovanadium has resulted in [ ].

Therefore, foreign vanadium producers enjoy advantages relative to U.S. vanadium producers as a result of less stringent regulations. This disparate regulatory burden places U.S. producers at a competitive disadvantage relative to their global competitors.

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[94] *See About Us*, FERROLAT, http://www.ferrolat.lv/index.php?option=com_content&view=article&id=26&Itemid=55. (**Exhibit 33**).

[95] *See* Country-Specific Ferrovanadium Import Statistics. (**Exhibit 34)**.

[96] *Id.*

2. VAT treatment encourages vanadium imports and discourages vanadium exports

The VAT regime in effect in almost every country other than the United States also weakens the domestic vanadium industry relative to foreign producers. Foreign producers of vanadium receive rebates of domestic VAT upon export and do not pay VAT when importing to the United States, while U.S. vanadium exporters are subject to VAT in the destination countries. For example, EU member countries rebate the VAT that is imposed on ferrovanadium when exported to the United States. Those VATs can range from 17 percent to 25 percent, depending on the country of origin. The VAT in Austria and the Czech Republic, the two largest sources of imports of ferrovanadium from the EU, are 20 percent and 21 percent, respectively. This export rebate is an incentive for EU producers to export ferrovanadium to the United States. In contrast, U.S. exports of ferrovanadium to the EU are required to pay the European VAT, increasing the price paid by the European customer for U.S. goods. Accordingly, the competitive environment in the vanadium industry is distorted, favoring foreign imports and disfavoring U.S. exports.[97]

IX. GLOBAL MARKET VOLATILITY HAS WEAKENED THE DOMESTIC VANADIUM INDUSTRY

The domestic vanadium industry also has suffered as a result of volatility in the global vanadium market. In particular, the global market is characterized by highly volatile vanadium prices and susceptibility to market distortions caused by Chinese industrial policies. Together, these forces have caused market tightness and have inhibited the investment necessary to develop and maintain a healthy domestic vanadium industry.

[97] *See* PETER NAVARRO & WILBUR ROSS, SCORING THE TRUMP ECONOMIC PLAN: TRADE, REGULATORY, & ENERGY POLICY IMPACTS (Sept. 29, 2016). (**Exhibit 35**).

A. Price Volatility Has Weakened The Domestic Vanadium Industry

Domestic pricing information for the vanadium industry is available through the CRU Group, which regularly publishes ferrovanadium prices.[98] **Exhibit 36** contains a chart and the corresponding monthly amounts illustrating the ferrovanadium prices for the period January 2016 through June 2019. As indicated, ferrovanadium prices have recently become particularly volatile. Prices peaked in November 2018 and have dropped by more than 80 percent since that time. The significant price volatility has resulted in a difficult operating environment in terms of planning and predictability.

The 2018 market price increases did provide some incentive for expansion or restart plans at domestic vanadium facilities. However, many of these plans have been jeopardized by the subsequent precipitous price declines during 2019. Gladieux originally reported that it intended to reopen by the fourth quarter 2017.[99] It again stated its intention to reopen by the first quarter of 2019,[100] but that reopening has still yet to occur. As noted above, AMG has announced plans to increase its capacity, but that expansion could be in jeopardy if prices continue to decline at the pace set in 2019. In addition, although Energy Fuels had historically produced vanadium pentoxide,[101] the fact that it could not meaningfully restart its vanadium

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[98] *See Ferroalloys prices*, CRU, https://www.crugroup.com/prices/ferroalloys/. (**Exhibit 36**).

[99] *See Facility Detail: Gladieux Metals Recycling*, CHWMEG, INC., https://chwmeg.org/asp/search/detail.asp?ID=319. (**Exhibit 37**).

[100] *Id.*

[101] *See* Press Release, Energy Fuels, "Energy Fuels Provides Update on Vanadium Production", *available at* http://www.energyfuels.com/news-pr/energy-fuels-provides-update-on-vanadium-production/. (**Exhibit 38**).

operations during the 2018 period of high market prices, serves as another example of the production and expansion difficulties experienced by U.S. domestic manufacturers. In fact, Energy Fuels recently indicated that it might have to shut down its vanadium pentoxide recovery operations if prices continue to fall.[102] Lastly, Stratcor faced similar expansion difficulties. Although Stratcor historically has manufactured vanadium pentoxide,[103] it did not meaningfully participate in the 2018 boom market, as its former corporate parent Evraz focused instead on its operations in Russia and the Czech Republic that were exporting ferrovanadium to the United States. As a result of these difficulties, both Energy Fuels and Stratcor had limited production during 2018 when prices peaked and have now declined more than 80 percent of the amounts reached in 2018.[104]

An additional factor contributing to price volatility is that much of the world's vanadium feedstock is slag produced as a result of steel production. The supply and availability of that slag is not related to the market price of vanadium, but rather solely the result of decisions regarding steel demand and general economic conditions.

B. Chinese Industrial Policies Have Inhibited The Development Of The Domestic Vanadium Industry

The global vanadium market is also vulnerable to significant distortions as a result of various Chinese industrial policies. China is both the largest supplier and largest consumer of vanadium globally. As a result, the vanadium market is significantly influenced by China, including its steel output. Indeed, modifications to Chinese industrial policy have already

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[102] *Without higher prices, Energy Fuels will shut V2O5 recovery*, In The Right Vein (August 4, 2019). (**Exhibit 39)**.

[103] *See supra* n. 65 at I-10-11.

[104] *See* **Exhibits 29** and **36**.

contributed to volatility in the global vanadium market. For example, in 2017, the global vanadium market entered into a deficit after a sustained period of oversupply.[105] Then, in November 2018, China imposed new production standards for high strength low-alloy rebar.[106] As a result, vanadium demand spiked significantly in 2018 in response to the Chinese regulatory changes.[107] This increased demand for, and consumption of, vanadium during this period further depleted global inventories and drove the market into an even greater deficit.[108] While an increase in Chinese vanadium demand benefitted vanadium producers in the short term due to price increases, some analysts expect that demand will drop off in the mid- to long-term and trigger a sustained period of oversupply.[109]

Moreover, in 2017 China notified the World Trade Organization ("WTO") that it would no longer accept imports of certain types of foreign waste, and that it would phase out import shipments of other waste products by the end of 2019. This ban on waste imports includes four types of vanadium slag.[110] Although slag producers that routinely supplied China are diverting

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[105] *See* Roskill, "What lies ahead for a vanadium market in deficit?" (May 7, 2019), *available at* https://www.globenewswire.com/news-release/2019/05/07/1818067/0/en/Roskill-What-lies-ahead-for-a-vanadium-market-in-deficit.html.

[106] *Id*.

[107] *Id.*

[108] *Id*.

[109] *Id*.

[110] In particular, China banned imports of the following categories of vanadium slag: slag containing more than 20 percent of vanadium pentoxide of slag, ore ash and residue; slag containing more than 10 percent but less than 20 percent of vanadium pentoxide in the slag, ore ash and residue; slag containing more than 20 percent of vanadium pentoxide of vanadium slag generated by producing steel; and waste catalysts containing vanadium. *See China announces import ban on 24 types of solid waste*, XINHUANET (Jul. 20, 2017), *available at* http://www.xinhuanet.com/english/2017-07/20/c_136459809.htm.

slag production to other foreign countries,[111] the Chinese import ban is expected to increase market tightness due to a reduction in input materials available in China.[112] Given that shifts in the Chinese market generate significant ripple effects in global vanadium markets, the U.S. vanadium industry remains vulnerable to these changes in the market conditions, inhibiting the development of the domestic vanadium industry.

Abrupt and consequential Chinese governmental policy shifts ultimately contribute to overall market volatility, which negatively impact domestic vanadium producers attempting to sustain or restart operations. Absent a stable market, U.S. vanadium producers will be unable to sustain operations, and some likely will again be forced to suspend their attempts to restart or expand their operations. Because the domestic suppliers of vanadium cannot meet domestic demand, U.S. vanadium consumers are forced to rely on foreign suppliers. Given that global vanadium supply and demand is driven in large part by China, the domestic vanadium industry, which is critical to our national and economic security, is particularly vulnerable to the distorting effects of Chinese policy shifts. It is therefore imperative that this Administration provide relief to the domestic vanadium industry under Section 232 to ensure the viability of the domestic industry and further insulate the industry from market distortions driven by abrupt Chinese policy shifts.

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[111] *Id*.

[112] *Id*; *see also* Roskill, "What lies ahead for a vanadium market in deficit?" (May 7, 2019), *available at* https://www.globenewswire.com/news-release/2019/05/07/1818067/0/en/Roskill-What-lies-ahead-for-a-vanadium-market-in-deficit.html.

X. THE DISPLACEMENT OF THE DOMESTIC VANADIUM INDUSTRY THREATENS TO IMPAIR THE NATIONAL AND ECONOMIC SECURITY OF THE UNITED STATES

As discussed above, the U.S. vanadium industry has struggled for 25 years with unfair trade. While the 2018 price increases helped to provide a renewed interest in this market, the subsequent 2019 price decreases serve as a stark reminder of the difficulties associated with developing the U.S. vanadium market. Vanadium is a vital input in both the U.S. critical infrastructure sector, including in the manufacturing of primary metals, machinery, and transportation, and the U.S. defense industrial base.[113] Given the strategic significance of vanadium to U.S. critical infrastructure and the U.S. defense industrial base, the displacement of the domestic industry by imports of vanadium seriously threatens the national and economic security of the United States.

A. The Viability Of The Domestic Vanadium Industry Is In Danger

1. Bankruptcies, idling of facilities and plant closures have resulted in a dwindling number of U.S. vanadium producers

To protect economic and national security, the U.S. vanadium industry should include multiple producers of ferrovanadium and vanadium pentoxide to serve as reliable domestic suppliers to domestic downstream consumers in the U.S. critical infrastructure and defense industrial base sectors. Historically, a number of U.S. manufacturers had the operating capacity to serve as reliable domestic suppliers. AMG and Bear have capacity to produce ferrovanadium. Energy Fuels, Gladieux, and Stratcor have capacity to manufacture vanadium pentoxide which can be either an input to manufacture ferrovanadium or feedstock to manufacture titanium alloys and superalloys.

[113] *See* Section VII.

Many of these companies experienced difficulties resulting in bankruptcy, plant closure or idled operations. With respect to ferrovanadium, in September 2016 Bear (producing ferrovanadium from vanadium pentoxide) was acquired in a bankruptcy auction by Yilmaden Holding, Inc. Bear was able to continue producing through bankruptcy, but its current production levels are projected to have declined from 2.5 million pounds of ferrovanadium in 2016 to 1.5 million pounds of ferrovanadium in 2019.[114]

With respect to vanadium pentoxide, Gulf Chemical and Metallurgical Company filed for bankruptcy in June of 2016 resulting in its purchase by Gladieux. Although Gladieux expressed an interest in restarting its operations in 2019,[115] that facility remains idled. Energy Fuels and Stratcor, both historical producers of vanadium pentoxide, had limited production during 2017 and 2018, and Energy Fuels only restarted its operations in 2019 and recently announced that it faces another potential shut down.[116] Energy Fuels, Gladieux, and Stratcor did not produce meaningful amounts of vanadium pentoxide during 2018 even though it was a period with unusually high market prices.

2. Declining employment

Petitioners do not have access to the confidential employment information of other vanadium producers, but Petitioners believe that the bankruptcies and idling of facilities has resulted in significant lost jobs in the vanadium industry. These employment declines would include lost professional and technical skills. While the 2019 restarting of some vanadium

[114] *See* **Exhibit 28**.

[115] *See* **Exhibit 37**.

[116] *See* **Exhibits 28** and **39**.

operations means that some jobs have returned, overall employment numbers are estimated to be significantly less than historic levels.

3. Declining U.S. output

U.S. production of vanadium has been steadily declining. Domestic ferrovanadium production is estimated to have dropped 15 percent from [ ] million pounds in 2016 to [ ] million pounds in 2018.[117] U.S. ferrovanadium production is projected to decline an additional 7 percent in 2019 to [ ] million pounds.[118] None of the three U.S. vanadium pentoxide manufacturers (Energy Fuels, Stratcor, or Gladieux) had meaningful production during 2016-2018 period, even with high vanadium prices experienced in 2018. Stratcor and Energy Fuels are projected to produce a total of [ ] million pounds of vanadium pentoxide in 2019, but the 2019 price reduction has caused significant uncertainty in the domestic vanadium market.

During this same 2016-2018 period, imports of vanadium products increased 31 percent from 16,964,648 pounds to 22,243,211 pounds.[119] While domestic production of vanadium pentoxide is projected to increase to [ ] million pounds in 2019 as a result of Energy Fuel's and Stratcor's restarting of their operations, those production targets remain uncertain. In addition, as discussed below, massive price declines during 2019 have caused significant uncertainty in the domestic vanadium market.

4. Loss of market share

The above production declines and increased import volumes have resulted in lost market share for the U.S. vanadium industry. [

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[117] *See* **Exhibit 27.**

[118] *Id.*

[119] *See* **Exhibit 26**.

].[120] For the vanadium oxide market, the limited, inconsistent, and episodic domestic production in recent years means that the domestic producers have essentially lost that market.

5. Financial losses

Petitioners do not have access to the confidential financial information for all of the domestic vanadium producers. Nevertheless, numerous references illustrate the financial difficulties experienced by domestic vanadium manufacturers. In May 2017, the ITC issued its final report finding that the domestic ferrovanadium industry was materially injured by imports from Korea.[121] That investigation, which focused on the period January 2013-September 2016, illustrates the volatile financial situation routinely faced by the U.S. ferrovanadium industry. From 2013 to 2014 the industry reported an increase in operating income.[122] By 2015, however, the industry's operating income had declined into an operating loss, and then returning to an operating income during the interim 2016 period.[123]

Since that time period, AMG, the largest domestic vanadium producer, reported operating profits for 2018. AMG's profits declined significantly in 2019 due to the steep decline in market prices. Specifically, AMG Vanadium LLC is part of the AMG Critical Materials division of AMG Advanced Metallurgical Group N.V. AMG Critical Materials Division publicly reported that revenues decreased 11 percent when comparing second quarter 2019 to second quarter

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[120] *See* **Exhibit 27**.

[121] *See supra* n. 65 at 1.

[122] *Id.* at VI-6.

[123] *Id.*

2018.[124] AMG's Critical Materials division also reported that earnings before interest, taxes, depreciation and amortization ("EBITDA") decreased by 66 percent when comparing second quarter 2019 to second quarter 2018.[125] Stratcor also experienced decreased earnings during this period. Stratcor's sales revenue decreased by 24%, 20% and 25% in each of the years 2016 through 2018, respectively; and in 2015, the cumulative decrease in total sales revenue was 53%. The revenue and earnings declines are entirely attributed to the massive drop in vanadium prices. Energy Fuels, a domestic manufacturer of vanadium pentoxide reported a $25 million net loss on its 2018 annual financial statements,[126] and a $28.3 million net loss for the first nine months of the year on its 3rd Quarter 2019 income statement, which is substantially greater than the previous year's losses at the same interval.[127] Gladieux, which purchased the bankrupt Gulf Metallurgical vanadium pentoxide facility that closed in April of 2017, has yet to restart those operations. Petitioners do not have access to the confidential financial information of Bear to report on the financial status of that company.

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[124] *See* AMG Advanced Metallurgical Group N.V., Investor Presentation Second Quarter 2019, 8 (2019), *available at* https://ig9we1q348z124x3t10meupc-wpengine.netdna-ssl.com/wp-content/uploads/Quarterly-Slides_August-2019.pdf.

[125] *Id*. at 4.

[126] *See* Energy Fuels, Inc. Form 10-K/A (2018), *available at* http://www.energyfuels.com/wp-content/uploads/2019/05/2018-10K.pdf. (**Exhibit 40**).

[127] In the 3rd Quarter of 2018, Energy Fuels' net losses amounted to $17.5 million. *See* Energy Fuels, Inc. Form 10-Q (Sept. 30, 2019), *available at* http://app.quotemedia.com/data/downloadFiling?webmasterId=101533&ref=114600041&type=PDF&symbol=UUUU&companyName=Energy+Fuels+Inc+%28Canada%29&formType=10-Q&dateFiled=2019-11-04&CK=1385849. (**Exhibit 41**).

6. Significant U.S. vanadium production capacity is underutilized or unutilized

The U.S. vanadium industry has experienced significant disruptions in capacity and manufacturing capability over the past few years. As noted above, Gulf Chemical and Metallurgical Company filed for bankruptcy in June of 2016. Its operations were idled a short time after that announcement. Energy Fuels and Stratcor, both producers of vanadium pentoxide, had limited production during 2017 and 2018.[128] None of these companies produced significant amounts of vanadium during 2018, even though it was a period with unusually high market prices. AMG estimates that it and Bear have significant unused domestic capacity to produce ferrovanadium, and AMG has approximately [ ] of ferrovanadium inventory. Energy Fuels reports that it has 1.15 million pounds of vanadium pentoxide inventory as of the end of the 3rd Quarter 2019.[129] Current capacity utilization for vanadium production in the United States is estimated to be 36 percent.[130]

B. U.S. Vanadium Demand Is Reliant On Foreign Supply

The reduced production levels and increased imports demonstrate that domestic production is unable to meet the domestic demand requirements necessary for critical defense and infrastructure applications resulting in reliance on foreign suppliers. As noted above, import penetration for vanadium consumed in steel applications (*i.e.* ferrovanadium and vanadium carbonitrides) is slated to increase to 67 percent in 2019.[131] This reliance on foreign suppliers is

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[128] *See* **Exhibit 28**.

[129] **Exhibit 41**.

[130] *See* **Exhibit 1**.

[131] *See* **Exhibit 27**.

even more problematic when considering that the United States no longer retains stockpiles of vanadium, and when factoring the country of origin for feedstock used to manufacture the imported vanadium. The vanadium products imported from the Czech Republic and Austria were produced primarily from Russian feedstock. Similarly, Canadian imports were produced from Brazilian feedstock. When considering the origin of the feedstock, approximately 88 percent of the imported vanadium is currently sourced from South Africa, Russia, Brazil, or China.[132] Based on the geographic location and nature of these foreign governments, the U.S. consumers of vanadium products are vulnerable to supply disruptions during periods of government instability, geopolitical tension, or armed conflict.

Given that the majority of foreign vanadium supplies are produced and thereby controlled by China and Russia, the United States is critically vulnerable to threats to its supply of vanadium. The United States Department of Defense has described both China and Russia as strategic competitors that seek to leverage economic and other policies to displace the United States and achieve global preeminence.[133] As a result, the domestic supply of vanadium is highly vulnerable to disruptions and interference by countries that seek to challenge the United States. Therefore, U.S. reliance on vanadium imports from Russia and China, in particular, poses a serious threat to the national security of the United States.

C. Domestic Vanadium Production Depends On A Healthy, Competitive U.S. Industry

Petitioners seek assistance under Section 232 during this critical period when the U.S. vanadium industry is attempting to restart idled operations or expand existing operations. AMG

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[132] *See* Vanadium Feedstock Country of Origin Summary. (**Exhibit 42**).

[133] *See* U.S. DEPT. OF DEFENSE, SUMMARY OF THE 2018 NATIONAL DEFENSE STRATEGY OF THE UNITED STATES OF AMERICA 2 (2018).

seeks to double its ferrovanadium production capacity from [

] as demand for environmentally friendly processing of spent catalysts and residues increases.[134] Also, after a long period of no vanadium production, Energy Fuels has set an annualized monthly production target during 2019 of 160,000 to 200,000 pounds of vanadium pentoxide.[135] Similarly, Gladieux has expressed an interest in restarting its vanadium pentoxide facility.[136] In addition, after a long period of limited production, as noted above Stratcor's new owner (U.S. Vanadium) plans to expand vanadium pentoxide production. Ensuring the long-term success of domestic facilities capable of manufacturing ferrovanadium and vanadium pentoxide is important given the strategic significance of both of these types of vanadium. However, absent assistance under Section 232, the domestic industry will struggle to achieve the growth necessary to be viable.

The relief sought is likely to have a limited impact on consumers of vanadium. For example, using the estimated average vanadium content overall in U.S. steel production, the cost of the vanadium in a ton of molten steel is less than $5.00 or less than 1 percent of the total price of steel.[137] Given that more than 90 percent of all vanadium consumed in the United States is

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[134] *See* Press Release, Advanced Metallurgical Group, "AMG Advanced Metallurgical Group N.V. Completes Feasibility Study to Expand Spent Catalyst Processing Capacity," *available at* https://www.globenewswire.com/news-release/2018/10/16/1622314/0/en/AMG-Advanced-Metallurgical-Group-N-V-Completes-Feasibility-Study-to-Expand-Spent-Catalyst-Processing-Capacity.html. (**Exhibit 43**).

[135] **Exhibit 38**.

[136] *See* **Exhibit 37**.

[137] The ITC similarly reported that the cost of vanadium in steel production represented, "a very small share (1-5 percent) of the cost of steel production." *See* USITC Pub. 4683 (May 2017) at Page II-8.

used in the production of steel, this calculation demonstrates the narrow and minimal economic impact that might be expected from the imposition of a remedy in these circumstances.[138]

XI. RELIEF REQUESTED

In light of the above, Petitioners request that relief be granted under Section 232. Petitioners request that the Secretary recommend and that the President impose tariffs of 40 percent *ad valorem* on subject vanadium imports from all sources. A 40 percent tariff would provide a significant level of price predictability and, accordingly, additional market certainty for buyers, sellers, and producers of vanadium. Investment in physical assets, research and development expenditures, and other long-term planning decisions would be aided by such a tariff. A tariff of this magnitude also would be sufficient to offset all but the most egregious underselling that unfortunately has been the hallmark of imports at various time and certainly recently. Alternatively, Petitioners requests that the Secretary recommend, and the President impose, separate tariff rate quotas ("TRQs") for (a) ferrovanadium and vanadium carbonitrides and (b) vanadium oxides and vanadates. Separate quota volumes are appropriate because of the different end market demand for these two groups of vanadium products. The proposed TRQs would impose a tariff of 20 percent *ad valorem* on imports up to a specified annual import volume and impose a tariff of 40 percent *ad valorem* on imports above the specified quota. In addition, the quota amounts for the first three years would decline by 10 percentage points each year. The initial annual import volume for ferrovanadium and vanadium carbonitrides would be 9,905,173 pounds of contained vanadium, the equivalent of 90 percent of annual imports for 2016 through 2018. The initial annual import volume for vanadium oxides and vanadates would

[138] The remainder of the vanadium consumed in the United States tends to be a very small proportion of even higher priced end products and so should have even more muted impacts on those consumers.

be 7,782,636 pounds of contained vanadium, the equivalent of 90 percent of annual imports for 2016 through 2018. These initial quota levels are intended to limit abrupt disruption of existing supply arrangements while the decline in quota levels is intended to provide the specific relief to domestic producers in the form of increased demand. In addition, Petitioners request that the Secretary recommend and that the President establish and fund a stockpiling program to purchase and maintain supplies of vanadium to ensure the availability of supply in the event of a national emergency.

Respectfully submitted,

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November 19, 2019

* * *

This Petition and the accompanying materials contain confidential and proprietary information of Petitioners, the disclosure of which would be harmful to the company's competitive interests. Petitioners seeks confidential treatment for all confidential materials contained herein pursuant to Section 705(d) of the Defense Production Act. All such confidential and proprietary information is also exempt from public disclosure under the Freedom of Information Act ("FOIA"). (5 U.S.C. § 552(b)(4)). Petitioners respectfully invoke the protections afforded to such confidential and proprietary information, and request that all such information be maintained in confidence and withheld in the event of any demand or request for release or disclosure. In the event of any such demand or request for release or disclosure of any Petitioners' confidential information,

Petitioners further request that BIS provide them with notice and an opportunity to be heard prior to any such release or disclosure.