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HELIUM

HEARING

BEFORE THE

COMMITTEE ON ENERGY AND NATURAL RESOURCES UNITED STATES SENATE

ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

TO

CONSIDER S. 783, THE HELIUM STEWARDSHIP ACT OF 2013

MAY 7, 2013

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HELIUM

TUESDAY, MAY 7, 2013

U.S. SENATE,
COMMITTEE ON ENERGY AND NATURAL RESOURCES,
Washington, DC.

The committee met, pursuant to notice, at 9:32 a.m. in room SD–366, Dirksen Senate Office Building, Hon. Ron Wyden, chairman, presiding.

OPENING STATEMENT OF HON. RON WYDEN, U.S. SENATOR FROM OREGON

The CHAIRMAN. The committee will come to order.

Today the committee meets to receive testimony on S. 783, the Helium Stewardship Act of 2013. This is a bipartisan bill that Senator Murkowski and I introduced to create an orderly phaseout of the commercial use of the Federal Helium Reserve while preventing the disruption of the helium supply chain upon which major parts of our economy depend. While many consumers only contact with helium comes when they are purchasing party balloons, it is a critical resource for a number of important sectors of the American economy.

It's used as a coolant for MRI machines.

It's used in semiconductor manufacturing, fiber optics manufacturing, and research and development.

It's used to pressurize and purge piping systems to detect leaks in specialized wells and to improve breathing mixtures for deep sea diving.

Substitutes are often unavailable. The current global supply is constrained. There have been some misconceptions about the helium program and this legislation to phaseout.

So what I'd like to do is spend a couple of minutes talking about what the program and the legislation is all about.

First, the helium program does not cost taxpayers money. It actually raises money. In fact, phasing it out over the next several years instead of abruptly terminating the program at the end of September will raise hundreds of millions of dollars.

Second, the legislation doesn't extend the Federal Helium Reserve indefinitely. The program will terminate for commercial users when the supply in the reserve falls below 3 billion cubic feet. At the current rate of sales from the reserve, that would occur within the next 5 or 6 years. The reserve currently supplies 40 percent of the domestic and 30 percent of global helium demand.

As our witnesses are going to discuss this morning, there simply are no practical alternatives to replacing that supply today. Under

the bipartisan legislation, BLM would be directed to phaseout commercial sales from the reserve over the next 5 or 6 years. This ought to give all parties the additional time needed to establish alternative sources of helium before the BLM wells go dry.

Current law requires the Federal Government to sell off the crude helium remaining in the reserve in order to repay the U.S. Treasury the $1.3 billion in debt that's incurred while creating it. That debt would be fully repaid this Fiscal Year. As a result, the helium program will terminate in October absent Congressional action.

Additional helium supplies were expected to be in place by the time the debt was paid off and commercial sales were terminated. Those supplies simply are not there now. If Congress does not extend operation of the Reserve, there would be a significant disruption in a number of sectors of our economy—everything from semiconductor manufacturing to medical imaging. Obviously this would come at a time when the American economy certainly doesn't need new obstacles.

Now, the House of Representatives has already acted. Two weeks ago they passed legislation similar to S. 783 by a vote of 394 to 1. It's important that the Senate proceed as well.

Our bipartisan bill has two primary objectives.

First, to ensure helium market stability for end-users and to ensure a fair return on this Federal asset to American taxpayers.

This legislation is designed to strike the right balance providing for an orderly, gradual transition resulting in minimal market disruption to end-users and at the same time finding a way to establish a fair market price and transparency that will increase return for taxpayers and stimulate private sector sources. Our bill calls for an additional auction of 10 percent of supply and increasing that amount by an additional 10 percent a year until only 3 billion cubic feet of helium remain in the reserve. These 3 billion cubic feet would be reserved for future Federal use, for defense, for aerospace, and research experiments that lead to the discoveries that drive economic growth. At the same time it would require the development of a long-term plan for Federal helium purchases.

Helium certainly is not the most high profile natural resource. It is significant. It is central to an efficient, well-run economy.

This legislation is critical to ensure that we continue on a trajectory for economic growth that protects domestic manufacturing jobs and our industrial partners as well as Federal users across the Nation.

Let me turn now to my friend and colleague, Senator Murkowski, for her opening statement and any comments she'd like to make.

STATEMENT OF HON. LISA MURKOWSKI, U.S. SENATOR FROM ALASKA

Senator MURKOWSKI. Thank you, Mr. Chairman. I appreciate the hearing this morning, but also your sense of urgency and that we need to address that. I think that that is important.

I welcome our witnesses. Look forward to the expertise that you will share with us today.

Just a couple observations, Mr. Chairman.

First is a practical consequence of current law. We only have until October to get this legislation to the President for signature. I think it's important that we meet that deadline by reporting a bill from this committee, letting the full Senate consider our work, reconciling any differences that we might have with the House and then allowing both chambers to consider the result.

Second point, I was surprised to see so many critical statements about the House's decision to debate and advance their own helium legislation a couple weeks ago. Clearly there are other pressing issues to consider. But I believe that moving legislation on small, but as you have pointed out, very important issues, such as this, even as we continue to debate the larger and more divisive ones.

I think that that reflects well in the Congress as a whole. The Floor is not just a place to have disagreements. It's also a place to take up legislation that we can agree on as the House now has on helium.

I would like everyone to know that Chairman Wyden and I appreciate the urgency here. We will work with leadership to advance the bill in a timely way. In the process I hope that we will be able to remind everyone that regular order works and is the process that is most likely to result in good, sound policymaking.

Last and perhaps on a more lighter note this morning, let me say that advancing this bill will lift a weight off the shoulders of many sectors that rely upon helium. It's a noble effort that can float above the partisan fray. We should all rise in support of it.

You got to have a little levity this morning, Mr. Chairman, on a rainy day.

The CHAIRMAN. I can't possibly compete with that. Well said, Senator Murkowski. You're absolutely right about the urgency of this.

We're going to work together and move this quickly.

So we have Mr. Tim Spisak, Deputy Assistant Director of the Bureau of Minerals and Realty Management at the Bureau of Land Management.

Walter Nelson, Director of Helium Sourcing and Supply.

David Joyner, President of Air Liquide Helium America.

Carolyn Duran, Senior Materials Manager at Intel.

Moses Chan, Professor of Physics at Pennsylvania State University.

We welcome all of you.

I know there's always a compulsion to kind of read your statement. We will put it, in its entirety, in the record. If you could take 5 minutes or so and perhaps just summarize your remarks, that would be helpful.

Why don't we begin with you, Mr. Spisak?

STATEMENT OF TIMOTHY R. SPISAK, DEPUTY ASSISTANT DIRECTOR, MINERALS AND REALTY MANAGEMENT, BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR

Mr. SPISAK. Mr. Chairman, Ranking Member Murkowski, thank you for the opportunity to testify on the helium, Federal Helium Program, and S. 783, the Helium Stewardship Act.

The bill would make various changes to the Helium Privatization Act of 1996 including establishing a phased approach to drawing

down the Federal Helium Reserve. As indicated by a National Academies of Sciences report published in early 2010, the market for helium has proven more volatile than expected over the last 15 years. The Department of the Interior supports S. 783 and welcomes the opportunity to improve the management of this valuable resource.

Helium is a critical, non renewable, natural resource. The most common and economic way of capturing helium is by recovering it during natural gas processing. The BLM plays a key role in the management and stewardship of the only significant, long term, storage facility of crude helium in the world, known as the Federal Helium Reserve which is located near Amarillo, Texas.

In the 1920s the U.S. Bureau of Mines built the Amarillo Helium Plant and the Cliffside Gas Field Facility to produce helium bearing, natural gas from a naturally occurring geologic field, known as the Bush Dome Reservoir.

In 1960 the Congress granted the Bureau of Mines the authority to borrow funds from the U.S. Treasury to purchase and store helium with the expectation that proceeds from future sales of helium would allow the Bureau of Mines to repay the borrowing. However, compound interest and the Federal demand rarely met the expectations underlined in the repayment loans of the Treasury's loan.

In 1996, Congress passed the Helium Privatization Act which required the BLM to offer for sale the vast majority of the stockpile of crude helium as well as getting out of the helium refining business.

Today, the BLM operates the Federal Helium Program with the primary goals of paying off the helium debt which the BLM anticipates doing at the beginning of Fiscal Year 2014 and providing the resource to meet public and private needs.

While sales of crude helium to private refiners make the most significant contributions toward paying off the debt, the BLM also manages the in-kind program which supplies helium to Federal agencies and grant holders for operations and research through private, authorized, Federal helium suppliers.

In 2000, the NAS published its first analysis of the impacts of the 1996 Act. Its general finding was that the Act would not have a material impact on helium users.

In early 2010 the NAS released a follow up report on the BLM's management of the reserve. The follow up report concluded that the mandated sell off is negatively impacting the needs of both current and future users of helium in the United States. This conclusion is the driving force behind a series of recommendations in the report directed at the BLM and Congress.

S. 783 addresses many of the concerns that the 2010 NAS report identified regarding the Federal Government's involvement in the helium market. Most importantly the bill will—would create a set of phased authorities for the BLM's management of the reserve establishing a glide path from the sales mandate and under the Privatization Act.

The Department supports S. 783 and the approach to gradually scale back the Federal Helium Program.

S. 783 stipulates 3 phases to the draw down.

Phase A, allocation transition.

Phase B, the auction implementation.

Phase C, continued access for Federal users.

Under the bill sales of crude helium during Phase B would be conducted partially at auction.

S. 783 would also reauthorize the helium production fund and require that the BLM disclose certain information related to the Federal helium system.

Furthermore, the bill would require the Secretary of the Interior and the Secretary of Energy to complete several reports and studies on helium.

Thank you for the opportunity to present testimony on the Federal Helium Program and S. 783. The BLM welcomes further discussion about the Federal Helium Program and the BLM's role in meeting future helium needs for the country.

I would be happy to answer any questions that the committee may have.

[The prepared statement of Mr. Spisak follows:]

PREPARED STATEMENT OF TIMOTHY R. SPISAK, DEPUTY ASSISTANT DIRECTOR, MINERALS AND REALTY MANAGEMENT, BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR

Mr. Chairman and members of the Committee, thank you for the opportunity to testify on S. 783, the Helium Stewardship Act, which would make various changes to the Helium Privatization Act of 1996, including establishing a phased approach to drawing down the Federal Helium Reserve. As indicated by a National Academy of Sciences (NAS) report published in early 2010, the market for helium has proven more volatile than expected over the last 15 years and the current law's requirement that the Bureau of Land Management (BLM) offer for sale nearly all of the Reserve by 2015 could pose a threat to the availability of this resource for future U.S. research, scientific, technical, biomedical, and national security users of helium. The Department supports S. 783 and welcomes the opportunity to improve the management of this valuable commodity.

BACKGROUND

Helium is a critical, non-renewable natural resource that plays an important role in research, medical imaging, space exploration, military reconnaissance, fiber optics manufacturing, welding and commercial diving. According to the NAS, helium's best known property, being lighter than air, means "that every unit of helium that is produced and used today will eventually escape the Earth's atmosphere and become one less unit available for use tomorrow."

The most common and economical way of capturing helium is by stripping it from natural gas during gas production. Geologic conditions in Texas, Oklahoma, and Kansas make the natural gas in these areas some of the most helium-rich in the United States, ranging from 0.5 to 1.5 percent of the gas extracted during production. The BLM plays a key role in the careful management and stewardship of the only significant long-term storage facility for crude helium in the world, known as the Federal Helium Reserve (Reserve), which supplies approximately 42 percent of domestic demand and approximately 35 percent of global demand for crude helium.

THE FEDERAL HELIUM PROGRAM

Because of helium's potential to lift military reconnaissance devices high above battlefields, the Federal government's interest in the resource dates back to World War I. Recognizing this key military use for helium, the Mineral Leasing Act of 1920 reserved to the Federal government all helium produced on Federal lands—a reservation that remains in effect today. After World War I, recognition of the potential for helium recovery in the Texas Panhandle, Western Oklahoma, and Kansas area (collectively, the "Hugoton" field) led to the development of the Federal helium program focused in that area. In 1929, the Bureau of Mines built the Amarillo Helium Plant and Cliffside Gasfield Facility near Amarillo, Texas, to produce helium-bearing natural gas from a naturally occurring geologic field known as the Bush Dome Reservoir.

After World War II, Federal use of helium shifted toward applications related to space exploration, and in 1960 Congress passed the Helium Amendment Act. This Act changed the program's mandate from exclusive government production of helium to conservation of the resource. This was to be accomplished by executing contracts with private natural gas producers to purchase extracted crude helium for the Federal government to store in the Bush Dome Reservoir. The Act granted the Bureau of Mines the authority to borrow funds from the U.S. Treasury to purchase the helium, with the expectation that the proceeds from future sales of helium would allow the BLM's predecessor agency in this area, the Bureau of Mines, to repay the debt. This borrowing authority, established by Congress in lieu of a direct appropriation, required the Bureau of Mines to repay the loan by 1985. Subsequent legislation extended the deadline to 1995.

Federal demands for helium rarely, if ever, met the expectations underlying the terms of the U.S. Treasury's loan to the Bureau of Mines. When the 1995 deadline to pay off the debt arrived, the $252 million the Bureau had spent on privately-produced helium had increased to $1.3 billion (principal and interest), and the Bureau of Mines appeared to have little prospect of repaying the debt. In his 1995 State of the Union address, President Bill Clinton stated that it was his Administration's goal to privatize the Federal helium program.

Congress subsequently passed the Helium Privatization Act of 1996 (HPA), which required the BLM (which assumed jurisdiction over the program after the termination of the Bureau of Mines) to make available for sale the vast majority of the stockpile of crude helium. The mandate directed the BLM to begin selling helium no later than 2005, in order to avoid market disruption. The BLM was to make a consistent amount of helium available every year at a price based on the amount of remaining helium debt and the amount of helium in storage. When Congress passed the HPA, there was approximately 30.5 billion standard cubic feet (scf) of helium in storage in the Bush Dome Reservoir. The HPA mandated the BLM to make available for sale all of the helium in excess of a 600 million scf permanent reserve.

Additionally, the HPA required the BLM to cease all helium production, refining, and marketing activities to effectively privatize the refined helium market in the United States. Finally, the Act provided for the NAS to review the impacts of the 1996 Act. The NAS published its first study in 2000, and released a follow-up report in 2010.

THE BLM'S HELIUM OPERATIONS

The BLM currently operates the Federal helium program with the primary goals of supplying helium to meet the Nation's needs of Federal helium users and paying off the "helium debt." To this end, the BLM has paid approximately $1.33 billion to the U.S. Treasury since 1995. This constitutes substantial progress toward eliminating the helium debt, which the HPA froze at approximately $1.37 billion. During FY 2012, the helium debt was reduced by an additional $180 million from Reserve sales, resulting in an outstanding balance of approximately $44 million at the end of the fiscal year.

According to the HPA, once the helium debt is retired, the Helium Production Fund (used to fund the BLM's helium program operational expenses) would be dissolved and all future receipts would be deposited directly into the general fund of the U.S. Treasury. The BLM has generated enough revenue during this fiscal year through currently authorized helium sales to pay off the debt at the beginning of FY 2014.

The BLM's current helium program, with a workforce of 51 full-time equivalents (FTE), operates not only the original storage and pipeline system, but also a crude helium enrichment unit, owned by private industry refiners, that facilitates transmission of helium to private helium operations on the BLM's helium pipeline. The BLM is responsible for administering helium extracted from Federal resources, including management of fees and royalty contracts. These operations are not limited to the Hugoton gas field, but also occur in fields in Colorado, Wyoming, Utah, and any other state where producers extract helium from the Federal mineral estate. Additionally, the BLM is responsible for administering the sell-off of crude helium to private refiners. These sales make the most significant contributions toward paying off the helium debt. The agency also conducts domestic helium resource evaluation and reserve tracking to determine the extent of available helium resources.

Another major part of the BLM's helium program is the "In-Kind" program, which supplies helium to Federal agencies (e.g., the Department of Energy and the National Aeronautics and Space Administration) for operations and/or research. Before the Helium Privatization Act, Congress required Federal agencies to purchase their

refined helium supplies from the Bureau of Mines. Under the current In-Kind program, Federal agencies purchase all of their refined helium from private suppliers who, in turn, are required to purchase a commensurate amount of crude helium from the Reserve. In FY 2012, Federal agencies purchased $10.3 million of helium through the In-Kind program.

THE NATIONAL ACADEMY OF SCIENCES REPORTS

In 2000, the NAS published its first analysis of the impacts of the HPA. Its general finding was that the Act would not have an impact on helium users. Additionally, the NAS report concluded that because the price-setting mechanism was based on the amount of the helium debt, and not the market for helium, the government's significantly higher price would mean the helium refining industry would buy crude helium from the BLM only as a last resort for fulfilling private contracts. However, private helium refiners would still be required to purchase crude helium from the BLM under the In-Kind program.

Over the course of the last decade, however, it has become apparent that assumptions underlying the 2000 NAS Report did not hold. First, the NAS's assumption that "[t]he price of helium [would] probably remain stable through at least 2010" has proven faulty. The market for helium has seen significant fluctuations on both the demand side—which dropped significantly in 2008 after peaking the prior year—and on the supply side, which experienced a significant decline in private supplies between 2006 and 2008. In the face of this volatility, prices for helium rose steadily over the course of the decade. By 2008, the market price for helium began to hover near the BLM's price, leading to greater withdrawals from the Reserve than the 2000 NAS Report anticipated.

Another market impact that the 2000 NAS Report did not address was international supply and demand for helium. According to the U.S. Department of Commerce, domestic consumption of helium decreased 2.7 percent per year from 2000-2007, while exports to the Pacific Rim grew 6.8 percent annually, exceeding the 5.1 percent growth rate in Europe. The international market also experienced supply issues because of refining capacity problems at plants in Qatar and Algeria, which would normally help supply both Europe and Asia.

In early 2010, the NAS released a follow-up report on the BLM's management of the Reserve. The report, entitled "Selling the Nation's Helium Reserve," focused on "whether the interests of the United States have been well served by the [HPA] and, in particular, whether selling off the Reserve has had any adverse effect on U.S. scientific, technical, biomedical, and national security users of helium."

The 2010 NAS report, which identified some shortcomings of the 2000 report, takes a markedly different tone than the 2000 report. This change in approach reflects the volatility of the helium market over the last decade. The NAS report analyzes the relationship between supply and demand for helium on a domestic and international basis, as well as the BLM's management of the Reserve under the HPA. The report concludes that the HPA mandated sell-off is negatively impacting the needs of both current and future users of helium in the United States. This conclusion is the driving force behind a series of recommendations in the report directed at the BLM and the United States Congress.

S. 783, Helium Stewardship Act

S. 783 addresses many of the concerns that the 2010 NAS report identified regarding the Federal government's involvement in the helium market. Most importantly, the bill would create a set of phased authorities for the BLM's management of the Reserve, establishing a "glide path" from the sales mandated under the HPA to a scenario where 3 billion scf of helium would be reserved solely for Federal users, grant holders, or contractors. This would accomplish the original goals of the HPA—the exit of the Federal government from the broader helium market and the paying off of the helium debt—while protecting long-term supply interests for the Federal government. The Department supports S. 783 and the approach to gradually scale back the Federal helium program. The Administration would like to continue working with the Committee and sponsors on details of a technical nature.

The bill stipulates three phases to the drawdown: "Phase A: Allocation Transition;" "Phase B: Auction Implementation;" and "Phase C: Continued Access for Federal Users." Phase A would begin on the bill's date of enactment and end on September 30, 2014. During Phase A, the BLM would be required to sell crude helium in a manner that would result in minimum market disruption. The Department believes that this time period is reasonable to prepare the market for broader program reforms.

Phase B would begin on October 1, 2014, and end when the volume of recoverable crude helium in the Reserve reaches 3 billion scf. During Phase B, the BLM would

balance factors involving the maximization of total recovery from the Reserve; the maximization of total financial return to the taxpayer; the amount of production capable from the Reserve; the demand of Federal users, grant holders, and contractors; and minimization of market disruption when determining the annual quantity of crude helium to offer for sale. Also during Phase B, the BLM would annually auction a percentage of the total crude helium offered for sale, beginning at 10 percent, and increasing by 10 percent increments each subsequent year, up to a maximum of 100 percent. This percentage would be subject to adjustment if necessary to minimize market disruptions that pose a threat to the economic well-being of the United States. The Department supports this phased approach to implementing an auction system, and believes that auctions can be implemented with minimal market disruption.

Phase C would begin when the volume of recoverable crude helium in the Reserve reaches 3 billion scf and presumably last until all recoverable helium has been exhausted from the Reserve. During Phase C, the BLM would be authorized to sell crude helium only for use by Federal agencies contractors, and grant holders. The Department supports the provision to reserve the remaining volume for Federal use.

Other significant aspects of S. 783 involve reauthorization of the Helium Production Fund and requirements that the BLM disclose certain information related to the Federal helium system. Reauthorization of the Helium Production Fund is consistent with the 2014 President's Budget, which includes a proposal to reauthorize the fund in combination with substantive reforms to BLM helium sales based on recent recommendations from the National Academy of Sciences. The Department and the BLM are committed to ensuring that the public receives a fair return on publicly owned energy and related resources. The Department and the BLM are also firmly committed to making information about how government operates more accessible, and consider transparency and open government a high priority. The Department looks forward to discussing these issues further with the sponsors and the Committee, and the Administration continues to evaluate any cost implications of this legislation.

Furthermore, the bill would require the Secretary of the Interior to complete several reports and studies on helium. These include global and national helium gas resource assessments, and, in coordination with the Secretary of Energy, national forecasts and global trends of helium demand and an inventory of helium uses in the United States. The bill would also direct the Secretary of Energy to support several areas of helium separation -related research; allow the Secretary of the Interior, in consultation with the Secretary of Energy, to assess the feasibility of establishing a facility to separate the isotope helium-3; and direct the Secretary of the Interior, in consultation with various Federal agencies, to submit a report to Congress on a Federal Agency Helium Acquisition Strategy. The Department supports additional studies and research on helium, but defers to the Department of Energy regarding the research projects for which the Department of Energy would have the lead.

Finally, the bill specifies that its provisions shall not affect or diminish the rights and obligations of the Secretary of the Interior and private parties under agreements in existence on the date of enactment, and directs the Secretary to promulgate such regulations as are necessary. The Department supports the provision which honors existing agreements between the BLM and private parties.

CONCLUSION

Thank you for the opportunity to present testimony on S. 783. The BLM welcomes further discussion about the Federal helium program and the BLM's role in meeting future helium needs for the country, especially for Federal agencies that depend on helium for scientific research, aerospace projects, and defense purposes. Since its formal discovery almost 120 years ago, helium has proven to be an increasingly important natural resource. The expansion of helium-related technology and declining domestic reserves means the importance of helium as a strategic resource is likely to increase. The BLM continues to serve the country by effectively managing the Reserve, and working with natural gas producers to efficiently extract helium from natural gas. I would be happy to answer any questions the Committee may have.

The CHAIRMAN. You've also set a land speed record for your testimony.

[Laughter.]

The CHAIRMAN. We thank you.

Mr. Nelson, welcome.

STATEMENT OF WALTER L. NELSON, DIRECTOR, HELIUM SOURCING AND SUPPLY CHAIN, AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA

Mr. NELSON. Good morning. Mr. Chairman, Senator Murkowski, thank you for the invitation to testify before the committee.

I applaud the common sense approach you have taken to develop a pragmatic bill to reform and reauthorize the private helium sales from the Federal Helium Reserve. This bill accomplishes the goal of maximizing the return to the U.S. taxpayer, ensuring the reliability of supply for end users, honoring contracts and property rights and it does this without disrupting helium supply chains. Very impressive.

With very few changes we hope it becomes law.

My name is Walter Nelson. I'm responsible for helium source management at Air Products, a Pennsylvania based industry gas company that operates in almost every State. Today I'm also representing the helium refiners, whose investments of tens of millions of dollars in the BLM's production and refining capacity have enabled Congress to accomplish its objectives of privatizing the helium reserve.

Before discussing details of the legislation, I want to make sure the committee understands how uncommonly complex the BLM system is. I've included a diagram with my testimony that enables you to see the unique and complicated intersection between private industry and government.

The government helium is stored under private land.

The crude helium is produced by a privately owned plant that owned or that's operated by the government.

It's transported hundreds of miles through a government owned pipeline where it is finally purified by privately owned refining plants.

Only then is the helium refined and available for usage by customers.

At each stage in the process: storing, delivering, refining and transporting the helium, we must make investments in plants, in equipment and personnel, all of which are underpinned by the contracts we have with the BLM and the contracts that we have with our end users.

This morning I'd like to focus on the ways in which S. 783 gets it right and two areas in which small changes would improve the bill.

First, the core idea of the bill, an auction starting at 10 percent and ramping up thereafter is workable. We believe that such an auction method would harness free market forces to deliver a fair return to the taxpayer while limited disruptions to the helium supply chain. By phasing in the auction, we can continue to have dependable supplies of helium allowing us to offer long term supply agreements so that businesses can engage in essential planning and avoid disruption in their operations.

The wisdom of your approach contrasts, with all due respect, with the House's approach with a semi-annual auction of 100 percent commences almost immediately. This would create tremendous uncertainty of supply to end users and the timing infringes on our existing contracts. The semi-annual auction, needlessly com-

plicates long term planning for every helium stakeholder, how much refining capacity to maintain, who will have helium and how much. Your bill provides the certainty that everyone is looking for.

Second, we support the price determination mechanism of the bill. The comprehensive confidential survey that will become the Henry Hub index for crude helium which will ensure that fair market prices will be obtained for helium in future years.

Third, it is essential to ensure that owners of previously purchased helium, currently sitting in storage within the BLM reservoir, are able to withdraw their helium in order to service the market. The reason this helium is sitting in the reservoir and not being refined and delivered to end users is due to the limitations of the current BLM production system.

The bill also recognizes that some helium inventory is necessary for proper functioning of the system. The House bill, on contrast, would put hundreds of millions of dollars worth of private helium off limits for years, an obvious unconstitutional taking.

Now I would like to share a few observations about aspects of the legislation that could be improved.

First, the bill requires the refiners as a condition to purchase non-auction helium make excess refining capacity available at commercially reasonable prices to those companies who want helium at an auction who do not have refining capacity. This is simply a reflection of what happens in the free market today. If there is excess capacity tolling agreements are entered into without any interference from Congress. Putting this is statute invites regulations that are unnecessary in a free market.

As shown in the diagram, our refineries receive helium not just from the BLM, but from various private companies, who extract helium from the nearby native gas fields. If there's a temporary slowdown in volume from the private sources, it may briefly appear that we have excess capacity, but we do not. The capacity that is contractually obligated for the private sources is not excess and cannot be used for tolling.

As the volume of the BLM does decline, some refineries will naturally be shuttered. If the committee deems that a tolling provision is essential, it should be amended to refer to only excess capacity that is operational and is not contractually obligated.

Second, the safety valve provision is important to give the Secretary the needed latitude in determining the amount to be auctioned. But to minimize market disruption we strongly urge the committee to give the Secretary the full discretion to increase or decrease the auctioned amounts as necessary.

Let me wrap up with these final remarks.

The world helium markets are in a state of transition and uncertainty. The world's current largest supply, the BLM reservoir, is in decline. Significant resources are coming online, but there have been repeated delays.

Shortages are creating tremendous volatility in the spot markets. This is not the type of environment to experiment with wholesale, untested changes in the world's most reliable and stable source of supply, the BLM reserve. The environment calls for level headed reforms that are phased in incrementally. That is exactly the approach you have taken.

Your bill would ensure that taxpayers get fair market value for the government's helium while preserving the stability that has benefited customers and high tech manufacturers across the country.

Thank you for the very pragmatic approach that you have taken to this very complicated issue. We stand ready to work with the committee to assure that we avert the helium cliff and develop workable legislation that ultimately becomes law.

Thank you.

[The prepared statement of Mr. Nelson follows:]

PREPARED STATEMENT OF WALTER L. NELSON, DIRECTOR, HELIUM SOURCING & SUPPLY CHAIN, AIR PRODUCTS AND CHEMICALS, INC., ALLENTOWN, PA

INTRODUCTION

Chairman Wyden, Senator Murkowski and members of the Committee, thank you for the opportunity to testify about helium legislation. My name is Walter Nelson and as Air Products director of helium sourcing and supply chain, I am responsible for identifying where Air Products will get its helium and how it will be delivered to our customers—I feel a personal and professional commitment to be sure that Congress gets helium legislation right.

First, I want to commend the leadership of this Committee for introducing a bill that, while not perfect, reflects real wisdom about how to address the BLM helium situation going forward. This bill accomplishes the goals of maximizing the return to the US taxpayer, ensuring the reliability of supply for end users, honoring contract and property rights, and it does this without disrupting the helium supply chains, all at the same time—very impressive!

I will use my testimony to review how we have arrived at the inflection point on helium that we face today, what choices Congress faces, and what the implications are for the choices that Congress will make. The House recently passed legislation that gives us concern. Helium refiners felt a great sense of relief when your bill was introduced, because it reflects pragmatic ways to approach the controversial issues embedded in the larger helium issue—a phase-in of an auction in a manner that is consistent with reliable helium supply to end users, and respect for existing contracts, which is essential to keeping the entire BLM system functioning properly. While the bill does include a tolling provision that has the feel of an intrusion on private property rights—more or less forcing us, as a condition for doing business with the US Government, to provide use of our employees and use of equipment we invested in for the sole benefit of competitors who chose not to make the same investments that we did. The bill, however, overall strikes a balance that we hope every stakeholder can support.

Let's be clear: Air Products and the other refiners are committed to assuring that helium in the BLM reserve remains accessible as of the time that BLM pays off its current debt, which by statute would otherwise terminate the federal helium program. The failure to enact legislation in time would be inexcusable, especially since the Senate has had such a broad bi-partisan consensus on a means to that end for over a year. We are glad to see that that same spirit of bi-partisanship continues in the form of S. 783. We hope that this legislation can move through the Senate promptly and that it will serve as the template for the final law.

AIR PRODUCTS AND ITS BACKGROUND IN THE HELIUM MARKET

Air Products, with revenues of roughly $10 billion per year, is an American corporation with a global industrial gas business. The company provides hydrogen for oil refineries so they can produce cleaner-burning gasoline, hydrogen for fuel cell cars and buses, liquid hydrogen for space launches, oxygen for patients in hospitals and to steel mills for use in blast furnaces, nitrogen to enable the manufacture of computer chips, and helium for MRI scanners and semiconductor manufacturing. In short, its core business is helping major industries operate more cleanly and efficiently. Air Products has more than 20,000 employees in over 50 countries.

Air Products is one of the leading suppliers of helium worldwide, and the largest refiner of helium on the BLM pipeline system. To be clear, helium is a byproduct of natural gas. We don't own the gas fields or operate the natural gas plants. Energy companies in that business extract the helium, and it's through our refineries that we supply helium to a wide range of manufacturers. The Company's equipment

processes more than half of the helium extracted from the earth globally, and it has pioneered many of the processes critical to getting helium from the ground to vital customers, such as extraction, production, distribution, and storage technologies used in the helium industry today.

That expertise was recognized by virtue of the United States government's selection of Air Products to engineer and construct the first helium extraction units when the federal government began its helium conservation program in 1959. More recently, Air Products designed and constructed the helium enrichment plant in 2003 that supplies the BLM's helium pipeline system, which continues to operate to this day.

Air Products decided to build its first helium refining plant over 30 years ago in the northern panhandle of Texas. The plant, designed and built by Air Products with proprietary technology, was first operational in 1982, expanded in 1985 and upgraded in 2010. Air Products subsequently constructed two more helium refining plants adjacent to a third party natural gas processing plant near Liberal, Kansas. The first plant started production in 1991 and the second plant, when completed in 1999, was the largest helium refining plant in the world. In 1995, Air Products became the first company to design and build a helium refining plant that used crude helium that had been extracted during the production of liquefied natural gas (LNG). More recently Air Products, through a joint venture with Matheson, constructed a helium refining plant in Wyoming. This plant was completed in 2011 and it is expected to begin production later this year when our supplier's natural gas plant becomes operational.

WHERE DOES HELIUM COME FROM?

Helium is one of the most abundant elements in the universe, however on earth helium is only found in naturally-occurring underground natural gas reservoirs. Additionally there are a limited number of locations around the globe where helium exists in high enough concentrations to make it economically feasible to capture and refine.

There are no naturally-occurring underground reservoirs of pure helium. Helium is a rare gas and it only forms in certain locations deep below the surface of the earth where the radioactive decay of uranium and thorium occurs with the formation of gas. While there is considerable attention to the discovery of gas formations throughout the US and the world, helium tends not to be found in most of them. The largest gas fields that are known to contain helium today are located in the United States, Algeria, Qatar, Australia, Iran and Russia. Approximately 75 percent of the world's helium supply currently comes from the United States, with 30 percent originating from the US Government's Federal Helium Reserve.

Helium refiners purchase crude helium from energy companies that are extracting helium from methane-rich natural gas, as well as from the BLM. Refiners then purify the helium, liquefy it by cooling it to -450 degrees Fahrenheit, and then transport and sell the helium into the global retail market. Once helium is extracted, purified, and liquefied, it has a shelf life of only 30 to 45 days before it begins to warm up and turn back into a gas. The liquid helium is transported globally from the liquefaction facilities to other facilities where the product is repackaged into cylinders, tube trailers and dewars for ultimate delivery to customers.

THE HISTORY OF CONGRESS'S ROLE IN ASSURING SENSIBLE MANAGEMENT OF HELIUM SUPPLIES

The recognition of the significance of helium to the national defense and for research and medical purposes prompted Congress to pass the Helium Conservation Act of 1925. From 1929 until 1960, the federal government was the only domestic producer of helium. The majority of the helium originally produced was used to support the Navy's rigid airship program, the precursor to today's blimps. During World War II, some helium was used in the Manhattan Project. Helium, in short, was vital to national defense.

After World War II, Congress advanced the cause of helium conservation through the Helium Act Amendments of 1960, pursuant to which Air Products constructed all nine of the original helium extraction units, a testament to the company's leadership in the field. The federal government then purchased all of the helium that was extracted and stored it in the Bush Dome, a geological structure within the Cliffside natural gas field located north of Amarillo, Texas. In 1973 the government stopped buying helium because it had accumulated more than enough helium for strategic uses as well as accumulated in excess of one billion dollars of debt over the 10 year conservation period.

Between 1980 and 2000, private industry constructed six helium refining plants at different locations along the BLM's 450 mile crude helium pipeline that extends from northern Texas through the panhandle of Oklahoma and into Kansas, to produce high-purity gaseous and liquid helium from both private and federal crude helium supply. In addition, these private companies began entering into storage contracts with the BLM to store helium in the Bush Dome, creating what became known as the BLM pipeline system, a unique and complicated intersection between private industry and government where both government and private helium is comingled in storage under private land. The crude helium is produced by a privately owned plant operated by the government, and is then transported hundreds of miles through a government-owned pipeline, where it is finally purified by privately owned refining plants. This system and its operations are very unique and only exist in the United States.

The commitment to privatization ushered in by Congress in 1995-96 prompted a reassessment of the historical federal role in helium, motivated by a desire to get the federal government out of enterprises that could be handled by the private sector. The result was the Helium Privatization Act of 1996. BLM was directed to shut down and close the government-operated helium refining plant near Amarillo, Texas, and to offer for sale the 30+ billion cubic feet of crude helium stored in the Federal Helium Reserve to private industry. Congress also directed that BLM's helium reserves were to be offered for sale over a 15 year period to pay off the $1.3 billion debt to the United States Treasury that was accumulated over 10 years during the helium conservation program. Congress contemplated a more extreme and immediate exit from the helium business but realized that such a course of action would have disrupted the market and been imprudent from the standpoint of the taxpayer and the end users of helium. Very similar conditions also exist today.

THE FEDERAL HELIUM RESERVE IS ESSENTIAL TO A STABLE HELIUM MARKET

The BLM today operates as a natural gas producer at the Cliffside field, where it extracts natural gas from wells, separates the gas, and then sells the natural gas and helium to private industry. BLM produces approximately two billion cubic feet of crude helium annually, which is about 30 percent of the worldwide supply. The BLM system consists of the Bush Dome, an underground storage reservoir where the United States government stockpiled helium during the conservation period and into which companies that have refined helium can deposit the helium until it is used; together with multiple natural gas wells that are used to extract natural gas from the ground and a gathering system of pipes which connects all the wells together; a helium enrichment plant to process the gas; and a 450 mile crude helium pipeline system that extends from northern Texas across the panhandle of Oklahoma and into Kansas.

The crude helium enrichment plant is operated by the BLM, but the plant is owned by an entity called the Cliffside Refiners Limited Partnership (CRLP), a partnership made up of helium refiners that owned facilities on the BLM pipeline in 2000. The CRLP partners include Air Products, Praxair, Linde (formerly the British Oxygen Company), and Colorado Industrial Gas (formerly owned by El Paso Energy and recently acquired by Kinder Morgan). The CRLP was formed in July 2000 with the charter to support the federal government in fulfilling the requirements of the Helium Privatization Act of 1996. The CRLP invested over $26 million at the Cliffside field to fund design and construction of the crude helium enrichment plant. BLM operates the CRLP-owned plant today, enabling the sale of government helium and natural gas (methane, in this case) to private industry. The CRLP was honored for excellence by the Secretary of the Interior Gail Norton in 2004—receiving the Four C's Award which exemplified Secretary Norton's Four Cs philosophy of consultation, cooperation and communication all in the service of conservation.

The BLM pipeline infrastructure today supports private industry by connecting eight private crude helium extraction plants and six private liquid helium refining plants to the BLM's reservoir at Cliffside. Without this pipeline system, private industry would not be able to efficiently deliver crude helium from the extraction plants to the helium refining plants in the region. The BLM pipeline system and the private industry helium plants together supply approximately two-thirds of the worldwide helium supply.

HELIUM PRIVATIZATION COULD NOT HAVE BEEN POSSIBLE WITHOUT PRIVATE INVESTMENTS

In 1996 Congress decided it wanted to privatize the helium in the BLM reservoir. I would like to direct your attention to the diagram of the BLM helium system that is attached at the end of this testimony. What sat in the reservoir at that point—

in the lower left of the diagram—was a mixture of helium with other gases. Government had injected helium into the reservoir decades before mainly for defense and scientific research purposes. When Congress decided to privatize the helium, the Cliffside helium enrichment unit, which is essential to refining the gas initially, did not exist. Private refiners invested millions of dollars to build it. Without that investment, the helium would still be in the ground. But once we built that plant 2003, the helium started to flow.

The non-refiners (our competitors) did not invest in the helium enrichment plant, nor did they invest in their own helium refineries. They had the resources to do both, but they did neither. They invested elsewhere. These companies, many years later, now complain that we have an oligopoly. Their position is that Congress should legislate that we have to use our private property and our prior investments for their private benefit through tolling. When they urge Congress to force us to use our private resources to refine helium, when they chose years ago not to invest in their own helium refinery, we hope you can understand why it does not feel fair to us. In fact, when we do have excess capacity and the commercial terms are right, we do already enter into "tolling agreements" with companies that do not have their own refining capacity.

HELIUM IS ESSENTIAL IN MANY VITAL WALKS OF LIFE

Helium is an indispensable element in the production of fiber optic cable, flat panel TVs, semiconductors, dataphones, and MRI scanners. There are no substitutes. Helium has very unique chemical and physical properties that make it essential to modern day life. It is the second lightest element (after hydrogen), and being lighter than air, it is used not just in balloons and airships but in other applications such as military surveillance and communication blimps. Because of its small molecular size, it is ideal for high tech leak detection. Helium is chemically inert and non-reactive which makes it a premier carrier gas for analytical testing and a protective gas for controlled atmospheres used in semiconductor manufacturing.

Liquid helium is the coldest substance on earth, so it is used to keep the electrical coils in MRIs cold, as well as for special low-temperature scientific research. Its low liquefaction point makes it vital to space launches where gaseous helium is used to pressurize and purge the flammable liquid hydrogen fuel. Helium has the highest ionization potential which makes it the gas of choice for high tech metal and plasma arc welding. It has very low solubility and is used to replace nitrogen in diving gas mixtures used by deep sea divers. Helium has very high specific heat and thermal conductivity which makes it ideal for the gaseous cooling of fiber optic cable and nuclear reactors.

WHAT IS CAUSING THE HELIUM SHORTAGE, AND WHEN WILL IT END?

The current shortage in the helium market is unprecedented. While the industry experienced a brief helium shortage back in 2006-2007, the current shortage started at the end of 2011 and we expect it to continue through 2013 until new helium sources are brought on-stream. The factors contributing to supply constraints include a decline in helium extraction from natural gas, disruptions in helium production from existing plants, and delays in the start-up of new facilities.

In the United States we have seen a decline in helium production as energy companies focus their drilling plans on natural gas that is rich in liquids rather than the dry gas which typically has more helium. Additionally, the BLM is allocating product because the helium reservoir is now in its final decline phase. In Algeria and Qatar, production of LNG and helium has decreased due to the fragile worldwide economy and maintenance work at the LNG facilities.

We expect helium supplies will continue to remain tight until new helium production begins in Algeria, Qatar and Riley Ridge, Wyoming later this year. The Algeria project is expected to add an additional two percent to worldwide helium capacity, Qatar II up to 18 percent, and the Riley Ridge project up to four percent. Only after these three new plants are operational and existing plants are back running at full output will the global supply begin to fully stabilize. Looking to the future—new sources of helium will still be required to offset BLM supply declines over the next 10 years and beyond.

This recent history of supply problems proves one thing: if the BLM system is off limits as soon as 2013, current shortages will be considered modest compared to the dire situation that helium users will face.

ENACTMENT OF A SUCCESSOR TO THE HELIUM PRIVATIZATION ACT OF 1996 IN 2013 IS ESSENTIAL

Air Products and virtually all stakeholders consider it essential for Congress to pass a successor statute that would preserve a system that for the most part has accomplished important objectives: assuring supply to essential uses of helium, preserving a BLM system that has many moving parts that need to work as a whole, and at stable prices. We see no reason to tinker with the essential functioning of the BLM system. But we don't have time to spare, and here's why.

The Helium Privatization Act of 1996 directed BLM to cease pure helium production and to sell off the helium remaining in the reservoir. The Act expires at the end of 2014. The best available modeling predicts that there will still be 10-12 billion cubic feet of recoverable helium remaining in the reservoir at the end of 2014. At current production rates of about two billion cubic feet per year, the reservoir could continue to produce helium for five to six more years.

This same modeling, however, has determined that the reservoir production rates will begin to decline to approximately one billion cubic feet per year after 2016. As a result, the usable life of the reservoir may be extended beyond 2020. This is sufficient time for new planned helium projects to become operational, replacing the lost Federal Reserve helium, but unless there is a successor statute to the expiring Helium Privatization Act of 1996, the BLM system will not be able to continue operations. To repeat: unless BLM has the authority to continue to operate the federal reservoir—which it won't if there is no successor statue—all of the helium that remains in the reserve will be inaccessible. That means that 30 percent of the worldwide supply will be essentially locked up, causing prices to skyrocket, some users with no ability to access helium, and chaos in the economic sectors that now rely on helium.

In fact, though, the time pressure is even worse. Under the statute, once BLM pays off the $1.3 billion debt accumulated by the federal government during the helium conservation period, pursuant to the Helium Privatization Act of 1996 the self-funded United States Treasury account will be closed and BLM could then only continue operations with appropriated funds. Otherwise, there will be no funding mechanism to allow BLM to operate the federal reservoir or the 450 mile pipeline that acts as a vital supply chain for private industry. When the 1996 Act was written, Congress projected that the reservoir would be depleted by the end of 2014, when the Act expires. Helium has been removed from the reservoir at rates lower than those projected at the time, which is why there remains helium to be managed and a successor statute necessary. Thus, the various walks of life that would come to a halt without helium would be affected not upon the expiration of the Helium Privatization Act of 1996 on December 31, 2014, but when there is no funding mechanism beyond the end of FY2013.

That said, we are confident that with new helium sources becoming operational over the next few years, we will not be back here, petitioning Congress for yet another extension of the helium legislation. As far as we are concerned, once the 1996 Act is extended to account for the sell-off of the remaining helium in the reserve—and we are fairly confident now that we know by when the reserve will be essentially depleted—the federal government will be out of the helium business for good (other than supplying limited helium supplies to federal research and defense needs).

ESTABLISHING A MARKET PRICE FOR HELIUM MUST BE DONE RIGHT

In the context of enacting legislation in a timely manner, Air Products advocates that the Department of the Interior develop and adopt a mechanism to establish a fair and reasonable market price for the remaining crude helium sold by the BLM from the reservoir. We believe the Secretary of Interior should be given authority to conduct a confidential survey and to collect data from private industry, which would be used in conjunction with federal helium royalty data, in order to determine market pricing.

We strongly recommend that Congress make clear that the Department of the Interior follow specific principles when using the confidential survey data to establish the market price. First, the pricing considered must be for volumes of helium that are similar in size to those volumes currently offered for sale by the Secretary. Helium purchases of small volumes will attract spot pricing, which may be higher and therefore will distort the survey data. Second, the pricing considered must be limited to sourcing transactions where the helium is being purchased for the first time. Any prices for the re-sale of wholesale helium in secondary or tertiary transactions must not be considered because these prices will include profit, which will distort the survey data. The confidential survey data collected must be comprehensive

enough to characterize all pricing escalation indexes, including any index or reference to the BLM's posted price for conservation helium.

Clear guidance must be provided to the Department of the Interior on which companies should be included in the survey, when the survey must be conducted, what data must be submitted, how the data must be classified, how the data should be interpreted, what the qualifications of the individuals to analyze the data must be, how confidentiality will be maintained, how to address non-compliance, and how to audit or validate the data to ensure falsification does not occur. Including all these requirements in any legislation is impractical. Instead, we recommend that these details be incorporated into the Committee report and in all other reports accompanying this legislation. We look forward to working with the Committee to achieve this important objective.

A PHASED-IN AUCTION IS THE BEST APPROACH

The core idea of this bill—an auction starting at 10 percent of annual BLM production and ramping up thereafter—is workable. We believe that such an auction method harnesses free market forces to deliver a fair return to the US taxpayer, while not causing disruptions to the helium supply chain. Refiners currently have storage and delivery contracts with BLM that expire in 2015. It is these contracts, in turn, that have allowed us to enter into contracts with end users, the high tech manufacturers who are so reliant on helium to make their products and serve consumers. By phasing in the auction, we can continue to have dependable supplies of helium allowing us to offer long-term supply agreement so that these businesses can engage in essential planning and avoiding disruption in their operations.

Let me take a moment to describe the problem with the auction approach taken in the House bill. To our customers, helium is as essential to certain product lines as is electricity. Imagine if there was a semi-annual auction for electricity, and large manufacturers did not know, from one six month period to the next, if their particular power company "won" electricity or not. That is the consequence of the House's approach, except the essential input is not electricity but helium. Long-term planning will be impossible, and spot pricing will be the order of the day. This can hardly be deemed a positive outcome. Helium customers would be faced with significant supply uncertainty and would not have the ability to plan as they do today. That is why the phased-in has such appeal.

For that reason, we will confess to concerns with even the Senate's auction in the out years, starting, say, when the auction will be 50 percent or higher. The good news is that new sources of helium appear quite likely to be coming on-stream by then, both in the US and around the world. If that were not the case, an auction of 50 percent or higher would raise questions about our ability to assure customers that they would know, with the certainty that they need, whether any helium refiner would have helium or not. We have the same misgivings as regards the federal users.

ASSURING THE GREATEST RETURN FOR THE TAXPAYER FROM SALE OF BLM HELIUM

Since this issue began receiving congressional attention last year, there has been a recurring theme: let's maximize the return to the US taxpayer. Refiners in general have no real stake in what price BLM establishes because our raw material costs are passed through to the market. Our main goal is assuring uninterrupted supply to our customers. But we should be clear about two facts. First, BLM could charge anything it wants for helium—today—under current law. There is no bar to BLM raising its pricing, and indeed, over the past three years, BLM has increased its prices by 30 percent, which we in turn had to pass on to our customers. Second, BLM could establish an auction under current law. There is no bar to that either. Should Congress be unable to reauthorize the helium statute, and should it be necessary to appropriate funds to keep the BLM helium program operating, BLM could raise its prices to whatever it wanted, and it could develop any lawful mechanism for selling the helium as well. Using the market survey that is included in S. 783, which BLM could do even without additional legislation, there is no reason that BLM could not be charging market price.

It appears that all this effort is going into a major revision of existing law because the National Academy of Sciences and Office of the Inspector General and Government Accounting Office all took a look at this issue and concluded that BLM wasn't getting a high enough price the helium it was selling. To repeat, BLM could charge anything it wanted to under existing law for its crude helium. But if the Committee is intent on directing BLM to do a better job of assessing what the "right" price should be, we think the direction to BLM to engage in a thorough confidential market survey, combined with at first a limited auction of the non-allocated amount of

helium, will result in price discovery that will maximize the return to the taxpayer. This price—not the auction price, but a price that is arrived at through many factors including the auction price—would then be the price assigned to the allocated amount, that is, the amount not sold at auction.

RESPECTING EXISTING CONTRACTS IS CRITICAL

Our contracts with BLM have been the bedrock of the ability to get helium to all of the customers—the large household name enterprises that justifiably want the BLM helium to remain accessible—who are intent, as we are, on getting legislation enacted in time. The provision in your bill that specifically respects existing contracts is important to keep the BLM system from being awash in litigation after enactment of new legislation. The Winstar case makes clear that Congress cannot pass legislation that necessitates a breach of contract without exposing the United States Government to liability for damages. Thankfully, your legislation does not appear do that.

CONDITIONING RECEIPT OF BLM HELIUM ON THE REQUIREMENT TO "TOLL" FOR COMPETITORS IS UNNECESSARY

A provision of the bill requires the refiners, as a condition to purchase non-auctioned crude helium, to make "excess refining capacity" available to those companies who succeed at auction that do not have refining capacity on the system "at commercially reasonable rates." The Committee needs to understand that this provision is merely a statement of the current state of affairs and "Economics 101" in the helium business. If refiners do have excess capacity, they already do offer it to non-refiners at commercially reasonable rates. We refer to these as "tolling agreements".

Our refineries receive helium not just from the BLM but from various other private companies who extract helium from natural gas in the panhandle region of the United States. We are contractually obligated to take the gas from these private sources. If there is a temporary slowdown in volume from the private sources, it may briefly appear that we have excess capacity, but we do not. The capacity that is contractually obligated to the private sources is NOT excess and cannot be used for other suppliers.

As the BLM helium supply declines, there will necessarily be refineries on the system that are not needed to be operational. We do not consider it appropriate for a statute to direct us to put into operation for the benefit of our competitors refining capacity that we have determined we do not need for ourselves.

If the Committee considers it essential to include a "tolling" provision in the legislation, we ask that "excess refining capacity" should only cover that capacity that is not "contractually obligated" and which is "operational."

We believe that the most effective manner to incent refiners to provide tolling services is to prioritize delivery according to who wins it at auction. By prioritizing any helium purchased at auction, this assures the winner will have pipeline delivery priority and not impact any helium that a refiner may have access to, thus ensuring that there could be a competitive market for refiners to toll and ensure their plant is running at as high a capacity as possible. We are in the business of selling helium, not of refining it for others who opted not to build their own refineries. If we truly have excess capacity, we put that capacity on the market. We recognize that the bill does not mandate tolling, yet it places a condition on our receipt of BLM helium that has the feel of interference in the free market, and puts us at the mercy of regulators or judges to determine the definition of a "commercially reasonable price" and whether capacity is truly "excess." This does not seem to be an appropriate role for Congress. We doubt that any of our customers would like to have Congress direct them to make product for their competitors.

IMPORTANT SECOND TIER ISSUES THE BILL MUST ADDRESS

Unlike its House counterpart, your bill addresses issues that are important to the optimal functioning of the BLM system. For instance, it is essential to ensure that owners of previously purchased helium, currently sitting as inventory in the BLM reservoir, are able to withdraw their crude helium in order to service the market. The reason that helium is sitting in the reservoir, and is not being refined immediately after being purchased, is the limitation of the pipeline capacity. Your bill wisely recognizes that helium in inventory is necessary for the proper functioning of the system. This minimizes the risk that helium will be left stranded, or would have to be vented. The House bill, in contrast, would put hundreds of millions of dollars of purchased helium off limits for years, an obvious unconstitutional "taking," and inconsistent with the smooth functioning of the overall system.

S. 783 provides for ongoing funding of operations and for the critical investments that will be necessary to support the BLM infrastructure—compression equipment, wells, and plant modifications, for instance. These improvements will be essential to ensure the maximum recovery of helium from the reservoir as it is depleted.

The "safety valve" is an important feature of S. 783, but in our view, it is important to give the Secretary full latitude to determine the amount to be auctioned. As the bill is currently written, the Secretary does not have the full discretion to manage auction amounts in a way that minimizes market disruption and increases returns to the U.S. taxpayer. This would require a small change in the bill so that the Secretary must meet the same standard, whether auction amounts are increased or decreased. We urge the Committee to give the Secretary full discretion to increase or decrease the amount to be auctioned, to minimize market disruption.

Finally, we are pleased that the bill addresses helium 3, an important strategic issue that needs and warrants attention from the federal government. There is currently an inter-agency task force, comprised of representatives from 14 separate agencies, looking at helium 3. The Department of Interior is not among those agencies. If the Secretary of Interior is to be given jurisdiction over helium 3 by virtue of the situation of BLM within the Department of the Interior, we recommend that the Secretary be directed to consult with the members of the task force before proceeding on this issue.

CONCLUSION

The world helium markets are in a state of transition and uncertainty, and the world's current largest supplier—the BLM reservoir—is in decline. Significant new sources are coming on line, but there have been repeated delays, and some of them are in politically unstable regions of the world. Shortages are creating tremendous volatility in the spot markets. This is not the type of environment in which to experiment with wholesale, untested changes in the world's most stable source of supply—the BLM Reserve. This environment calls for level-headed reforms that are phased in incrementally. That is exactly the approach you have taken. Your bill would ensure that taxpayers get a fair market price for the government's helium, while preserving much of the stability that has benefited consumers and high-tech manufacturers across the country.

Congress got it right when it established the federal helium reservoir and the surrounding infrastructure managed by BLM. The system has worked well for decades. Congress got it right yet again in the Helium Privatization Act of 1996, when it set in motion a process for selling off the helium previously captured in the federal reservoir. End users have had helium when they need it, and price and access have been stable. The public does not think much about helium—aside from party balloons and blimps—because the system has worked so well.

S. 783 is a good bill. Apart from the needlessly intrusive tolling provision, we are highly supportive of it, and we would expect that all stakeholders would share this view. Unlike its House counterpart, if S. 783 became law, it would allow helium to flow uninterruptedly through the BLM system, there would be limited change in the supply of helium to end users, and BLM would have full authority—which we believe it has today—to charge full market rates for helium, thus assuring a healthy return to the US taxpayer.

The Senate's approach to the helium issue, from the start, has been informed, measured, pragmatic, and workable. Since our business rests on implementation of a workable method for moving BLM's helium reserves to end users, we want to do everything we can to see that the Senate's approach is enacted. We have been gratified by the bipartisan, non-ideological support this Committee's leaders commanded for their helium bill last year, and we are pleased to see the same this year. Air Products appreciates the opportunity to testify again on this issue, and will do everything we can with our know-how to advise Congress along the way to an outcome that everyone can be proud of.

Mr. Chairman and Senator Murkowski, thank you for the pragmatic approach you have taken to this complicated issue. We stand ready to work with the Committee to assure that we avert the helium cliff and develop effective legislation that the President can sign into law.

The CHAIRMAN. Thank you, Mr. Nelson.

Mr. Joyner.

STATEMENT OF DAVID JOYNER, PRESIDENT, AIR LIQUIDE HELIUM AMERICA, INC.

Mr. JOYNER. Good morning, Chairman Wyden, Ranking Member Murkowski and members of the committee.

My name is David Joyner. I'm the President of Air Liquide Helium America. I appear today on behalf of American Air Liquide Air Gas Incorporated as well as Matheson Tri-Gas Incorporated, who are the major participants in the domestic helium markets who do not currently operate refineries on the Federal helium pipeline.

Collectively despite being practically shut out of the market for the Federal crude helium, our companies serve a significant portion of the U.S. helium market. We're deeply appreciative of the work of the committee and its staff in assuring our participation as you consider this legislation and at a level consistent with our involvement and importance to the U.S. helium market.

As you would expect our companies are different and each of us has views on the legislation that are specific to our individual corporations. We have each submitted statements reflecting those views. I'm here today to share with you those 4 principles upon which we all profoundly agree. Those are extending the operation of the Federal Helium Reserve, expanded market access and transparency, as well as the enactment of the conditional tolling provision.

First, we all agree that the legislation to extend operation of the Federal Helium Reserve is vital to the U.S. economy. Failure to continue operation of the reserve would remove close to a third of the global helium supplies and almost half the domestic supply from the market. Accordingly we appreciate the amount of energy and time you have devoted to achieve this vital goal.

Second, we strongly endorse the expanded access and market transparency that your legislation seeks to foster. Three companies who operate refineries on the Federal helium pipeline have enjoyed near exclusive access to the reserve for almost 20 years. As documented by the Department of the Interior's Inspector General, this arrangement has potentially cost the U.S. taxpayer $100 million over the life of the program. It's also destroyed markets and free market principles. Expanded access and market transparency are items that are long overdue.

To achieve these goals you have included an auction process and several other provisions designed to ensure greater access to the Federal helium market. For those goals in this legislation to be realized, we believe the expansion of access begin sooner than the late 2014 date specified in the current bill. If there is an extended period before the auction begins we would recommend that there be an immediate and significant increase in the allocation to other buyers and to non-refiners.

Another year of 100 percent allocation to the 3 companies is antithetical to the goals supported in this legislation and would again, postpone any benefits that would accrue to U.S. taxpayers and end users by increasing the competition and access. Now while our companies have some difference of opinion on the precise allocation percentages. We all agree that the non-allocated share of annual

volumes should be increased substantially, something much closer to the portion of the market we serve.

In expanding access by adjusting these allocations is not complex and it does not necessitate the continuation of near 100 percent allocation to the 3 refineries for another year. We believe that if refiners are to be guaranteed access to a percentage of volumes then non-refiners should also be guaranteed access to a percentage of volumes as well.

Finally, if these purchase volumes should be linked to a delivery schedule from the BLM. So if you purchase the volumes you have the ability to actually take delivery of them.

On a related matter, we believe the inclusion in the bill of language related to refiners existing contracts is unwarranted. It provides them with protections which go beyond those in the contracts themselves. The U.S. House of Representatives agree with this position. Overwhelmingly defeated an amendment offered by Representative Dent that would provide such additional protection.

In support of this principle we believe that the auction percentages not reserved for refiners should be allotted to non-refiners who own and maintain adequate facilities and equipment to meet delivery schedules and quality standards for deliveries to end users. This would both promote open competition and ensure that the market will not be subject to the actions of outside speculators and ensuring reliable supply to end users. In the same vein we believe that no participation in the auction process should be permitted—no participant in the auction process should be permitted to acquire more than 30 percent of the auction volumes to ensure that a broad array of buyers participate in these auctions.

Finally our companies strongly support the provision calling for conditional tolling service for both the auction process as well as for any Federal crude helium purchase outside of auction percentages. We appreciate the committee's recognition that the goals of increased competition and greater return to taxpayers cannot be achieved without some certainty of access to tolling services.

Mr. Chairman, as documented by the reports issued by the DOI Inspector General and the National Academy of Sciences, the existing regime for Federal helium sales is deeply flawed and extending the operation of reserve this is a one time opportunity to correct the flaws of that regime by ensuring greater competition which will help secure the supply for end users and a fair return for the U.S. taxpayers.

We appreciate the many positive changes that your legislation makes to the current situation and believe that with the suggestions we've made your legislation will fully accomplish the goals of the committee.

I look forward to answering your questions. Our group looks forward to working with you throughout the process.

[The prepared statement of Mr. Joyner follows:]

PREPARED STATEMENT OF DAVID JOYNER, PRESIDENT, AIR LIQUIDE HELIUM AMERICA, INC.

Good morning Chairman Wyden, Ranking Member Murkowski, and members of the Committee. My name is David Joyner, and I am the President of Air Liquide Helium America, Inc., the helium company for American Air Liquide. I appear today on behalf of American Air Liquide, Airgas Inc. and Matheson Tri-Gas, Inc., who are

the major participants in the domestic helium market that do not operate helium refineries on the federal helium pipeline. Collectively, despite being practically shut out of the market for federal crude helium, our companies serve a significant portion of the U.S. helium market. We are deeply appreciative of the work of this Committee and its staff in ensuring our participation as you consider this legislation and at a level consistent with our involvement and importance to the U.S. helium market.

As you would expect, our companies are different, and each of us has views on the pending legislation which are specific to our individual corporations. See individual company statements attached hereto as Appendix A*. We have each submitted statements reflecting those views. I am here today to share with you those core principles upon which we all profoundly agree:

- Extending the Operation of the Federal Helium Reserve;
- Expanded Market Access and Transparency; and
- Enactment of the Conditional Tolling Provision

First, we all agree that legislation to extend operation of the Federal Helium Reserve is vital to the U.S. economy. Failure to continue operation of the reserve would remove close to one-third of global helium supplies and almost half the domestic supply from the market. Accordingly, we appreciate the amount of time and energy you have devoted to achieving this vital goal.

Second, we strongly endorse the expanded access and market transparency that your legislation seeks to foster. Three companies who operate refineries on the federal helium pipeline have enjoyed near exclusive access to the reserve for almost 20 years. As documented by the Department of the Interior's Inspector General, this arrangement has potentially cost the U.S. taxpayer $100 million over the life of the program. It has also distorted markets and, in some cases, led to supply shortages. Expanded access and market transparency are items that are long overdue.

To achieve these goals, you have included an auction provision. While our companies have some difference of opinion about auctions, for this auction to be most meaningful, we believe it should begin much sooner than the 2014 date specified. Auction of federal helium is not a complex process. The auction involves the sale of a single commodity to a limited number of bidders on an annual basis. This is far less complex than many other auction processes which routinely occur in different markets, and we fully believe that the Bureau of Land Management is well equipped to get the process underway in short order. Accordingly, we believe a workable auction process can be put into place within 180 days of enactment. Alternatively, if the current timeline is to be kept, it is imperative that, in the intervening year, the current allocation system employed by the BLM must be modified to ensure greater access. Another year of 100 percent allocation to three companies is antithetical to the goals supported in this legislation and would again postpone any benefits that would accrue to U.S. taxpayers and end-users by increasing competition and access.

While our companies have some difference of opinion on the precise allocation percentages, we all agree that the non-allocated share of annual volumes should be increased substantially—something much closer to the significant portion of the market we serve. I reiterate, the auction process is not so complex that it necessitates the continuation of a near 100 percent allocation to the three refiners. We believe that if refiners are to be guaranteed access to percentage volumes then non-refiners should also be guaranteed a percentage of volumes. On a related matter, we believe the inclusion in the bill of language related to the refiners' existing contracts is unwarranted, and provides them protections which go beyond those in the contracts themselves. The U.S. House of Representatives agreed with this position and overwhelmingly defeated an amendment (312-87) offered by Reps. Charles Dent (R-PA) and Elizabeth Esty (D-CT) that would provide such additional protection. See Joint Letter from Non-Refiners attached hereto as Appendix B**.

In support of this principle, we believe that the auction percentages not reserved for refiners should be restricted to non-refiners who own and maintain "adequate facilities and equipment to meet delivery schedules and quality standards" for delivery to end-users. This would both promote open competition and ensure that the market will not be subjected to the actions of outside speculators. In the same vein, we believe that no participant in the auction process should be permitted to acquire more than 30 percent of auction volumes.

Finally, our companies strongly support the provision calling for conditional tolling services both for the auction process as well as for any federal crude helium pur-

* See Appendix II.
** See Appendix II.

chased prior to the time when the auctions begin. We appreciate the Committee's recognition that the goals of increased competition and greater return to the taxpayer cannot be achieved without some certainty of access to tolling services.

Mr. Chairman, as documented by the reports issued by the DOI Inspector General and the National Academy of Sciences, the existing regime for federal helium sales is deeply flawed. In extending the operation of the reserve, this is a one-time opportunity to correct the flaws of that regime by ensuring greater competition which will help ensure security of supply for end-users and a fair return to the U.S. taxpayer. We appreciate the many positive changes that your legislation makes to the current situation and believe that with the suggestions we have made your legislation will more fully accomplish the goals that you have set forth.

I look forward to answering your questions and our group looks forward to working with you throughout this process.

The CHAIRMAN. Thank you, Mr. Joyner.

We're all so very happy to have a talented Oregonian here. Dr. Carolyn Duran, Senior Materials Manager from Intel, a major Oregon private sector employer. I understand you're speaking for the Semiconductor Association as well. So Ms. Duran, welcome. Please proceed with your remarks.

STATEMENT OF CAROLYN DURAN, PH.D., DIRECTOR OF CHEMICAL RISK AND COMPLIANCE, GLOBAL SOURCING AND PROCUREMENT, INTEL CORPORATION

Ms. DURAN. Thank you. I think I brought the Oregon rain with me because it's sunny and 85 right there, right now.

So, Mr. Chairman and Ranking Member Murkowski, thank you for the opportunity to testify on the Helium Stewardship Act of 2013. I am here on behalf of Intel, the Semiconductor Industry Association and a broader coalition of industrial and scientific users of helium.

My name is Carolyn Duran. I'm the Director of Chemical Risk and Compliance for Global Sourcing and Procurement at Intel Corporation. In this capacity I'm responsible for risk mitigation for chemicals and gases used in our manufacturing technologies. I appreciate your efforts to address the critical issue of helium supplies for American industry.

The current BLM authority to operate the Federal Helium Reserve expires October 7th of this year. Currently the reserve represents around 30 percent of global supplies of helium and closure would result in significant supply line disruptions affecting multiple industries. S. 783 is key legislation that directly addresses this risk ensuring a continued, stable supply for the next few years.

Our coalition shares concerns around the eminent closure of the reserve. The existing deadline heightens the criticality of the situation. We, the downstream users of helium, urge the Senate to mark up and pass legislation quickly so that serious supply disruptions can be averted.

Semiconductors are a foundational American industry and one in which we have maintained a global lead since its inception. Our sector is the second leading export industry and employs over a million direct and indirect jobs in related industries throughout the economy. Semiconductors and the products they enable are the cornerstone of all modern electronics which in turn enable virtually every aspect of modern life from health care to transportation to energy and so on.

Where does helium fit in?

Its inert nature, small size, high thermal conductivity and extremely low boiling point make it an ideal and unique chemical for many applications. Within semiconductor manufacturing it's used as a carrier gas for deposition processes and as a dilutant in plasma etch processes. It's an ideal choice for testing equipment for leaks and helps maintain an ultra clean environment needed for these advanced technologies.

Helium is important in the medical industry where MRIs rely on the extremely low boiling point to enable the super conducting properties of the magnets necessary to enable the technology.

Additionally helium is critical to the scientific community where its unique properties enable advancements in condense matter physics, brain research and cryogenics, to name a few.

The helium supply market has experienced and is currently facing supply shortages. Many U.S. users of helium have had to struggle through reduced helium deliveries and significant price increases. Where possible we've reduced our consumption through conservation, substitution and recycling, but our dependence on helium cannot be eliminated.

This leads me to the key issue at hand. If U.S. users are already struggling to obtain a stable supply of helium, what would happen if the reserve ceased sales of 30 percent of the world's supply to private entities? While the exact results cannot be known I can say with confidence that it would be disruptive to an already tenuous supply line. Our industry, already realizing shortages, would be directly impacted. An extended shortage would have a broad impact to the very industries that rely on our products.

Congress must take action immediately to prevent significant disruption in the helium market. Without prompt action 30 percent of the world's supply of helium will be no longer available. This potential result would be harmful to our economy and is completely avoidable. The Helium Stewardship Act of 2013 would help continue the supply of helium while also transitioning the program to a more market based, transparent system.

Our broad based group of industrial and scientific helium end users developed a set of principles that we hope will guide the efforts of Congress to address the helium supply. S. 783 is consistent with these principles.

The bill provides a framework for secure supply in the near term by providing for continued operation of the reserve and the sale of helium to private entities.

It provides price transparency through clear reporting requirements for both the BLM and those who purchase helium.

The phase in approach of the auction addresses the potential of short term supply instabilities.

The gradual phase in and annual cadence provides for additional certainty that will help support long term supply contracts with existing suppliers.

The bill also contains several important provisions to help increase future supplies of helium.

One improvement we would strongly urge the committee to consider is to include very clear language that provides that in the event of an implementation delay, for whatever reason, the current process for allocating helium would remain in place. The current

bill includes much appreciated language aimed at minimizing market disruption, but we think it needs to be strengthened and made clear to ensure a disruption does not occur.

We have raised this issue with the committee staff. We are confident that they understand our concerns and that appropriate revisions to this language can be incorporated into the bill.

Intel Corporation and the rest of the semiconductor industry, as well as our broader coalition, are reliant on a consistent, secure supply of helium. We are appreciative of the extensive work done by Chairman Wyden and Senator Murkowski on this bill to address the imminent danger posed by lack of action.

Once again, we urge the Senate to mark up and pass legislation quickly to extend the authority of the BLM past the October 7th expiration date. This is absolutely necessary to prevent disruption to an already tenuous supply of helium.

Thank you for the opportunity to testify on behalf of Intel Corporation, the broader U.S. semiconductor industry and our coalition of industrial and scientific users of helium. I'm happy to take questions.

[The prepared statement of Ms. Duran follows:]

PREPARED STATEMENT OF CAROLYN DURAN, PH.D., DIRECTOR OF CHEMICAL RISK AND COMPLIANCE, GLOBAL SOURCING AND PROCUREMENT, INTEL CORPORATION

Mr. Chairman and Ranking Member Murkowski, thank you for the opportunity to testify on behalf of Intel and the Semiconductor Industry Association on the "Helium Stewardship Act of 2013" (S.783). My name is Carolyn Duran, and I am the Director of Chemical Risk and Compliance for Global Sourcing and Procurement at Intel Corporation. In this capacity I am responsible for risk mitigation for chemicals and gases used in our manufacturing technologies globally. I appreciate your efforts to address the critical issue of helium supplies for American industry.

The current BLM authority to operate the Federal Helium Reserve expires October 7, 2013. Currently, the Federal Helium Reserve represents around 40 percent of the US supply of helium and 30 percent of global supplies, and closure of the Reserve would result in significant supply line disruptions affecting multiple industries within our country. S.783 is key legislation that directly addresses this risk, ensuring a continued, stable supply of this critical material for the next few years. I am here today not only on behalf of Intel and the Semiconductor Industry Association (SIA), our industry trade association,[1] but also as part of a broader downstream coalition[2] comprised of companies across many manufacturing sectors as well as scientific users of helium, all of whom share similar concerns around the imminent cessation of sales of helium from the Federal Helium Reserve.[3] The existing deadline heightens the criticality of the situation, and we, the downstream users of helium, urge the Senate to mark-up and pass legislation quickly, so that serious supply disruptions can be averted. This important legislation must move forward promptly in order to avoid damage to our economy and to maintain U.S. leadership in advanced manufacturing and scientific leadership.

Founded in 1968, Intel Corporation is the world's largest semiconductor company, with net revenues of $53.3B in 2012. Intel continues to invest in US manufacturing, with over half of our roughly 100,000 person employee base residing in the United States. Intel's latest technologies for microprocessor fabrication, assembly and test are developed and implemented Oregon and Arizona. In 2012 alone, Intel invested

[1] Information on SIA is available at www.semiconductors.org.

[2] Our coalition includes the following companies and organizations: American Physical Society, Applied Materials, Corning Incorporated, Cree, Inc., The Dow Chemical Company, Fairchild Semiconductor, Freescale Semiconductor, General Electric Company, GLOBALFOUNDRIES Inc., Information Technology Industry Council (ITIC), Intel Corporation, IBM Corporation, Kodak, Materials Research Society, Medical Imaging & Technology Alliance (MITA), Micron Technology Incorporated, National Electrical Manufacturers Association (NEMA), ON Semiconductor, Philips, Semiconductor Industry Association (SIA), Siemens, and Texas Instruments Incorporated.

[3] See http://www.energy.senate.gov/public/index.cfm/files/serve?File__id=02eced68-3093-4794-bb52-15a26f3481ef.

over $8.5B in capital in the United States. Additionally, over three quarters of our chip manufacturing occurs in U.S. factories located in Arizona, New Mexico, Oregon and Massachusetts. Our products are sold globally with more than three quarters of our revenues occurring outside the United States. Helium is a critical element in many aspects of our leading edge technology manufacturing processes.

Semiconductors are a foundational American industry and one in which the U.S. industry has maintained a global lead since its inception. Our sector is the second-leading export industry and employs almost 250,000 employees in jobs with wages that average over $120,000—well above the average of the rest of US manufacturing. The broader economic impact of our industry is much greater. SIA studies indicate that in addition to jobs in our sector, those jobs support over a million indirect jobs in related industries throughout the economy. Even broader still, semiconductors and the products they enable are the cornerstone of all modern electronics, which in turn enable virtually every aspect of modern life, from health care to transportation to energy and so on.

But Intel and the semiconductor industry is not alone in our reliance on helium to deliver advanced technologies. Helium is a critical component in the medical industry, where MRI's rely on the extremely low boiling point (4 degrees Kelvin, near absolute zero) to enable the superconducting properties of the magnets necessary to enable the technology. Many companies use helium to create a protective atmosphere for arc welding. Eighteen percent of helium goes to laser welding used in the production of numerous products, including electrical and auto components. An additional six percent is used for testing of air-conditioners for leaks. Additionally, helium is critical to the scientific community, where its unique properties enable advancements in condensed matter physics, brain research and cryogenics, to name a few. In short, helium is critical to important sectors of America's economy and leadership in advanced manufacturing, as well as our country's leadership in scientific advancements.

In order to illustrate the importance of helium in producing today's leading edge semiconductor products, I'd like to take a moment to walk you through the complexities of our manufacturing processes. Our most sophisticated semiconductor products feature more than a billion transistors etched onto silicon die the size of a fingernail. Realizing this level of complexity takes several hundred steps and several weeks on the manufacturing line, all inter-related. The world's leading scientists and engineers use sophisticated equipment and processes to control at the atomic level, across wafers as large as twelve inches in diameter. At each step in the process, researchers develop new processes, using many different chemicals, to deliver the required properties resulting in improved performance and better products. The advancement of semiconductor technology over time, commonly known as "Moore's Law," has driven the semiconductor industry to extraordinary achievements which today result in semiconductor chips that provide phones, tablets and notebooks with more computing power than rooms of computers decades ago. While Intel releases a new technology every two years, behind this is several billion dollars in R&D investment and six or more years of engineering effort. With each new technology requiring roughly twenty-five percent new tools, delivering new technologies is incredibly capital intensive. Leading edge semiconductor manufacturing equipment can cost over $100M per "tool," and a new factory can cost upwards of $5 billion dollars.

Chemicals and gases are critical to the manufacturing process. If one were to look at the periodic table, you would find that many of the elements are used in our manufacturing process. Helium is one of these gases. In fact, helium is one gas that is used pervasively throughout the process, and without it, our factories would not operate.

This is true for all semiconductor manufacturing, not just Intel. Why is this the case? Helium has unique physical and chemical properties that are utilized not only within the manufacturing process steps, but also to help achieve the ultra-clean manufacturing and assembly environments essential for advanced semiconductor manufacturing.[4] As an inert gas with high thermal conductivity, it is used as a carrier gas for deposition processes, and as a dilutant in plasma etch processes. Its low boiling point (4 Kelvin, near absolute zero) enables specialized wafer cooling applications. Additionally, due to the small size and inertness of the helium molecule, it is an ideal choice for testing equipment for leaks. This is used for safety testing for other chemicals used in the manufacturing process, as well as to maintain the ultra-clean environment needed for these advanced technologies. It is these same properties that make helium compelling for use in semiconductor manufacturing that make helium difficult to manage. The small size of the molecule, while critical for leak testing, results in leakage out of the very containers used to store helium. Just

[4] National Academies of Science, "Selling the Nation's Helium Reserve" (2010) at pp. 63, 67.

like helium leaking out a helium balloon, cylinders of helium lose roughly 1 percent of the gas each day. Due to this fact alone, we are dependent of regular deliveries to our facility to maintain a stable supply line. Any disruption, even of a few days, could slow production in a semiconductor facility. A significant delay could result in the need to shut a facility down. This is an untenable option for our company and other industries, and for the country as a whole.

Due to prior shortages, over the past several years Intel and other manufacturers have worked to replace helium with alternatives, such as argon or nitrogen, where possible. We continually undergo conservation efforts in both existing and new technologies. In some cases, the degradation in properties or performance associated with alternatives has led to a need to continue utilization of helium. When transitions to alternate gases are feasible, they typically result in costly retrofits to existing tools and equipment used to make our products. When helium is utilized for its low boiling point, as in MRI's and condensed matter physics, there simply are no substitutes.

The helium supply market has experienced and is currently facing supply shortages. Many U.S. users of helium have had to struggle through reduced helium deliveries and significant price increases.

This leads me to the key issue at hand: If U.S. users are already struggling to obtain a stable supply of helium critical to their technology, what would happen if the Federal Helium Reserve ceased sales of 30 percent of the world's supply to private entities? While the exact results cannot be known, I can say with confidence that it would be disruptive to an already tenuous supply line. The semiconductor industry, already realizing shortages, would be directly impacted. If the supply were to be disrupted for a significant amount of time, the resulting shutdown of our manufacturing facilities would directly impact the overall economy. A shortage impacting our industry will have a broad impact to the very industries that rely on our products, including health care, transportation and the energy sectors. While this outcome is not likely, it is possible, but unacceptable. We have seen supply line disruptions in other areas of the semiconductor business that have led to price increases and shortages.

THE HELIUM STEWARDSHIP ACT OF 2013 (S. 783)

Congress must take action immediately to prevent significant disruption in the helium market. Without prompt action, BLM's authority to sell helium from the Reserve will expire later this year, and 30 percent of the world's supply of helium will no longer be available to important sectors of our economy. This potential result would be harmful to our economy, and is completely avoidable. The Helium Stewardship Act of 2013 would help continue the supply of helium, while also transitioning the program to a more market-based, transparent system.

Our broad-based group of industrial and scientific helium end-users developed a set of principles that we hope will guide the efforts of Congress to address the helium supply. These principles include the following:

1. Establish a framework for secure, continuous supplies of helium that can be implemented through long-term contracts with suppliers.
2. Ensure price transparency.
3. Provide for mechanisms to prevent market speculation or manipulation.
4. Adequate transition period to assure continuity in supplies.
5. Promote increased supplies of helium in the future.

The "Helium Stewardship Act of 2013" (S.783) is consistent with the spirit of these principles. The bill provides a framework for a secure supply in the near term by providing for continued operation of the Federal Helium Reserve and the sale of helium to private entities. It provides price transparency through clear reporting requirements for both the BLM and those who purchase helium. The phase-in approach of the auctions addresses the potential of short-term supply instabilities; the gradual phase-in of the auction and annual cadence provides for additional certainty that will enable companies to work with existing suppliers and help support long-term supply contracts. The bill calls for an annual auction, which our coalition believes will enhance the reliability and stability of the helium supply. The bill also contains several important provisions to help increase future supplies of helium.

One improvement we would strongly urge the Committee to consider is to include very clear language that provides that, in the event of an implementation delay of the new auction, for whatever reason, the current process for allocating Helium would remain in place. The current bill includes much-appreciated language aimed at minimizing market disruption, but we think it needs to be strengthened and made clearer to ensure a disruption does not occur. We have raised this issue with

the Committee staff, and we are confident that they understand our concerns and that appropriate revisions to this language can be incorporated into the bill.

Intel Corporation and the rest of the semiconductor industry, as well as our broader coalition, are reliant on a consistent, secure supply of helium to produce our products, and we are appreciative of the extensive work done by Chairman Wyden and Senator Murkowski on this bill to address the imminent danger posed by lack of action. Once again, we urge the Senate to mark-up and pass legislation quickly to extend the authority of the BLM past the October 7, 2013 expiration date. This is absolutely necessary to prevent disruption to an already tenuous supply line of helium, critical natural resource.

Thank you for the opportunity to testify on behalf of Intel Corporation, the broader US semiconductor industry, and our coalition of industrial and scientific users of helium. I am happy to take any questions.

The CHAIRMAN. Dr. Duran, thank you.

I particularly appreciate your focusing on the relationship of helium to the American industrial base. I think we all understand, as Oregonians, for example, how important this has been to semiconductors, to electronics. I think what you've done is taken the Oregon message, something we see translate into high skill, high wage jobs in our State and make it writ large so it affects the whole country and what it means for American industry. So I thank you very much.

Ms. DURAN. Thank you.

The CHAIRMAN. You make Oregon proud today.

Alright.

Dr. Moses Chan, Professor of Physics.

STATEMENT OF MOSES CHAN, PH.D., PROFESSOR OF PHYSICS, PENNSYLVANIA STATE UNIVERSITY

Mr. CHAN. Good morning, Mr. Chairman and Senator Murkowski. I appreciate the opportunity to testify before you today.

My name is Moses Chan. I teach physics at Penn State University. I'm a member of the National Academy of Sciences. I served in a committee convened by NRC to address a number of questions regarding the current law that required the selloff of the Federal Helium Reserve. A report of this study was issued in 2010.

I testified before this committee last year with regard to the Helium Stewardship Act of 2012. In my testimony this morning I have updated my statement I have made before. I'm glad the committee is picking up this important issue again.

We have heard from Dr. Duran that how important helium is for a lot of industry of our country. I will speak, however, this morning primarily from the perspective of a low temperature scientist. We, as a group, are interested in understanding the behavior of material and also electronic system close to absolute zero, liquid helium provides the means to cool it down to such a temperature.

These studies are not as esoteric as it seems. Everyone in this room have cell phones. We also have other sophisticated electronic system as pointed out by Dr. Duran. The physical principle how this sophisticated electronic equipment and other semiconductor physics were made possible by the discovery and clarifying painstaking experiment carried out under the low temperature environment.

Magnetic resonance imaging, MRI, is another example of society benefit that exists only as a result of ground breaking experiments in 1950s and 1960s carried out at low temperature. In addition in

order for MRI devices to work there must be very strong and extremely stable superconducting magnet. This is provided by immersing the magnet in liquid helium.

These examples are only a small example of low temperature experiments that have been made to the benefit of society. Ongoing research conducting with the help of liquid helium in our Nation's universities, for example on quantum computing and in the other government lab and industrial laboratories as well, will, without a doubt, lead to new technology that will improve our children and grandchildren's lives and contribute to the economic well being of our country.

The scientific community uses, in fact, a very small fraction of the helium in the world market estimated to be about 3 percent. However because of the nature of the experiment where it's truly vulnerable to any delay or shortage of the supply of helium, if a shipment of liquid helium is late by more than a couple of days then the experiment must be warmed up prematurely. Weeks or even months of work will become useless.

Since liquid helium is very cold it is constantly boiling off in the storage container. It is not practical for any university or government lab to stockpile large quantity of liquid helium in anticipation of a late shipment.

The price of helium is another important issue. A typical helium scientist in my university are supported by a research grant by NSF or DOE and other government agency. Liquid helium often accounts for up to 40 to 50 percent of the budget of the grant. Therefore any substantial hike in the price will have a detrimental effect on the research program.

Unfortunately in the last 4 years the price of liquid helium has really gone up on the order of 400 percent. Therefore say from about $3.50 a liter now. Some of our colleagues are paying $15 a liter, in University of Oregon, by the way.

The price hike appears to be accelerating. For example last year, between last year and this year, the price of some of our colleagues getting 100 percent increase in the price.

In addition interruption in supply loss in more than a week happened in 2006 and 2007 and also happened last summer in 2012 where at least 29 universities and laboratories have helium shipment abruptly canceled or delayed. This interruption and price hike is creating havoc to a lot of the research programs.

The 2010 NRC report identified a number of problems with aspect a straight line selling off the helium reserve required to take place by 2015. I've included some of the recommendations in the written testimony that was in this report. I'm heartened to see that the Helium Stewardship Act of 2013 that you are considering is addressing many of the problems identified in the report.

I want to take this opportunity to highlight the recommendations that directly affect the helium research community.

The report recommended that researchers with helium Federal grants be allowed to participate in the existing program for government user of helium that would give them priority when there is a helium shortage. I'm very pleased that the Stewardship Act responds positively to this recommendation.

Following the issue of our report, BLM began to allow researchers, individual researchers, to register for the in kind program. But the implementation of this in kind or at cost plus program have been having some difficulties. As I point out some of our colleagues are paying prices like 4 or 5 times larger than other people. Ensuring this in kind balance at cost plus expenses program to be applied consistently and with transparency is extremely important.

The NRC report also recommended that the funding agency like NSF, DOE, help researchers to acquire helium recycling equipment that would reduce the long term need of buying new liquid helium. Unfortunately it appears that because of limited funding this recommendation has not been implemented in any significant degree.

I thank you for your attention. I will be happy to answer any questions.

[The prepared statement of Mr. Chan follows:]

PREPARED STATEMENT OF MOSES CHAN, PH.D., PROFESSOR OF PHYSICS, PENNSYLVANIA STATE UNIVERSITY

Good morning, Mr. Chairman, Ranking Member Murkowski, and members of the Committee. My name is Moses Chan. I am a Professor of Physics at Penn State University and a member of the National Research Council's Committee on Understanding the Impact of Selling the Helium Reserve.[1]

I will be discussing the study prepared by that committee as part of testimony on S. 783, The Helium Stewardship Act of 2013. The study was commissioned by the Department of the Interior's Bureau of Land Management (BLM) and the principal task of our committee was to determine whether the sell-off of the nation's helium reserve as prescribed by law has had an adverse effect on the United States' scientific, technical, biomedical, and national security users of helium. Our committee concluded that the sell-off has had and will continue to have adverse effects and we developed a series of recommendations to address several outstanding issues with respect to the reserve.

To provide context for those recommendations, I will first give a brief overview of our critical helium needs, with a focus on the plight of the small research user community, and also discuss those uses where substitutes or conservation and recycling are possible. I will follow this with a discussion on several matters addressed in the report—helium supply issues, the federal helium reserve itself, and the sale of federally owned helium. My testimony will conclude with a discussion of the committee's major recommendations regarding the reserve and its management in the future.

USES OF HELIUM

Ready access to affordable helium is critical to many sectors in academe, industry and government and the range of those uses is quite impressive, enabling research at the coldest of temperatures, weather monitoring, surveillance in areas of combat, and optical fiber production, among many other applications.

The diversity in uses for helium arises from its unique physical and chemical characteristics—specifically, its stable electronic configuration and low atomic mass.

Among those unique characteristics are the temperatures at which helium undergoes phase transitions (liquefies and freezes). Helium has the lowest melting and boiling points of any element: It liquefies at 4.2 Kelvin and 1 atmosphere and solidifies only at extremely high pressures (25 atmospheres) and low temperatures (0.95 Kelvin). These characteristics have led to many cryogenic applications for helium; the largest single category of applications by percentage of helium consumed. These range from the efforts of individuals engaged in small-scale cryogenic research to large groups using high-energy accelerators and high-field magnets. All rely upon helium to conduct their research and because the federal government supports many of these researchers, it has a direct stake in their continued success. Cryogenic users also include segments of the medical profession, not only for biological

[1] The National Research Council is the operating arm of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine of the National Academies, chartered by Congress in 1863 to advise the government on matters of science and technology.

research in devices such as superconducting quantum interference devices (SQUIDS), but also for diagnosis with tools such as magnetic resonance imaging (MRI) devices.

Helium's ability to remain liquid at extremely low temperatures also gives rise to its usage for purging and pressurizing systems and as such, helium is a critical component in our nation's space exploration and defense efforts. The National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD) use significant amounts of helium, as it is the only gas that can be used to purge and pressurize the tanks and propulsion systems for rockets fueled by liquid hydrogen and oxygen.

Other uses rely on helium's lifting capabilities. As the second lightest element, gaseous helium is much lighter than air, causing it to be quite buoyant. When combined with helium's chemical inertness—especially when compared with the highly flammable alternative, hydrogen—its buoyancy makes helium an ideal lifting gas. NASA and the Department of Energy (DOE) use helium to support weather-related missions and various research and development programs funded by these agencies, both at government facilities and at universities. DOD also must have ready access to helium to operate the balloon- and dirigible-based surveillance systems needed for national security.

Other applications draw on other characteristics of helium—its relatively high thermal conductivity, low viscosity, and high ionization potential—either alone or in combination. These applications include welding, providing controlled atmospheres for manufacturing operations, and detecting leaks in equipment providing vacuum environments to science and industry. Table 1 summarizes the principal applications of helium and the share of use in the United States.

Small-Scale Researchers.—Among the events that triggered this study were soaring prices and limited supplies that characterized the refined helium market in the fall of both 2006 and 2007. The committee, composed of individuals from a wide range of professions—economists, business people, and scientists—noted that small-scale scientists were particularly hard hit by price shocks and interruptions in the supply of refined helium during that time. An informal poll conducted by committee members of approximately 40 research programs at universities and national laboratories that use helium indicated that shortages of liquid helium interrupted the helium supply for almost half of these programs, with some interruptions lasting for weeks at a time during the late summer and fall of both 2006 and 2007. For many of those scientists, losing access to helium, even temporarily, can have long-term negative repercussions for their research.

In general, the federal grant programs that support these researchers simply are not designed to cope with significant pricing shifts and other market volatilities experienced here. Grants typically are for a two to three year period and for a set amount that does not adjust if a principal expense of research such as helium significantly increases. Further, the relatively short duration of such grants, with no guaranty of renewal, effectively precludes these research programs from entering into long-term contracts that might at least partially reduce the risk of significant prices increases and shortages.

Domestic vs. foreign consumption.—The balance between domestic and foreign consumption of helium has shifted significantly in the past 15 years. Until the mid-1990s, substantially all helium production took place in the United States. This factor, combined with high shipping costs and limited availabilities, meant that until recently, the amount of helium consumed abroad was fairly small. In 1990, for example, 70 percent of worldwide helium consumption was in the United States.

Since 2000, the demand for helium in the United States has remained fairly constant but has grown significantly elsewhere, reducing the U.S. share of total consumption. See Figure 1*. Foreign growth has been assisted by the opening of several helium-producing facilities outside the United States that will be discussed later in this testimony, as well as by improved capabilities in the short-term storage and handling of refined helium. This period also saw a significant increase in industrial applications, principally in semiconductor and optical fiber fabrication facilities outside the United States, and the shifting of industrial facilities that use helium from the United States to foreign countries. By 2007, United States helium consumption had dropped to below 50 percent of worldwide demand. Despite a slight downturn in overall demand for helium associated with the global recession in 2008-2009, the committee believed, based on recent trends, that foreign demand should continue to increase relative to demand in the United States.

Substitution, Conservation, Recovery.—For some applications, other gases can replace helium, but other applications rely critically on helium's unique properties and

* Figures 1–3 have been retained in committee files.

there are no alternatives. Applications in the first category, where substitutes for helium might exist, include these:

- Lifting.—For these uses, where low density is the only requirement, hydrogen is sometimes substituted if safety concerns can be met.
- Welding.—Here, chemical inertness is the key property. For processes such as gas tungsten arc welding—a critical process applicable to reactive metals such as stainless steel, titanium, aluminum, and others in high-value, high-reliability applications—Europe mostly uses argon, while the United States uses helium.
- Semiconductor and fiber optics manufacturing.—In these applications, high thermal conductivity is the important property. Often, hydrogen may be substituted.

In the above applications, economics, market conditions, availability, safety, and legislation can influence the choice among helium and other gases.

In contrast, other applications require the unique properties of helium, typically relying on the extremely low boiling point of liquid helium to achieve a desired result. These applications include the following:

Purging/Pressurizing.—Entities such as NASA and DOD must purge and then pressurize liquid hydrogen (LH_2) and liquid oxygen (LOx) rocket propulsion systems and fuel tanks that may be at liquid air temperatures or colder. Although gaseous hydrogen might have the right physical properties for use in LOx systems, its reactivity with oxygen precludes its use. Nitrogen is not desirable because nitrogen might contaminate the LOx. In LH_2 environments, all gases other than helium and hydrogen would freeze, clogging fuel lines and systems and rendering the rocket engines nonfunctional.

- Superconductivity.—All applications that employ superconducting magnets, including medical magnetic resonance imaging (MRI) machines, high energy accelerators and many high field magnets used in research, rely on the continued availability of helium. Current materials and technologies dictate that only helium can act as the crucial refrigerant to cool these materials below superconducting thresholds.
- Basic research.—Here, no other substance can be used as a refrigerant to achieve temperatures from 4.2 K above absolute zero down to millikelvins.

SUPPLY OF HELIUM

Sources.—Helium is the second-most-abundant element in the universe, but its diffusive properties mean that atmospheric helium leaks into space, rendering it relatively scarce on Earth. At only 5.2 parts per million (ppm) in air, it is not economically feasible to extract helium from the atmosphere using current technology. Rather, the principal source of helium is natural gas fields. Helium nuclei (or alpha particles) are produced in the radioactive decay of heavy elements such as uranium and thorium, located in Earth's crust. While most of these helium atoms find their way to the surface and escape, a small fraction are trapped by the same impermeable rock strata that trap natural gas. Such natural gas usually consists primarily of methane and secondarily of ethane, propane, butane, and other hydrocarbons and various other contaminants, including H_2S, CO_2, and He.

There are three different situations in which helium contained in natural gas may be economically recovered:

- Helium may be extracted as a secondary product during the primary process of producing methane and natural gas liquids (NGLs) such as propane, ethane, butane, and benzene.
- For natural gas fields that have sufficient concentrations of helium and other non-fuel gases such as sulfur and CO_2 to economically justify their extraction, the gas in those fields may be directly processed for the non-fuel constituents.
- Helium may be extracted during the production of liquefied natural gas (LNG), which consists primarily of liquefied methane.

For the first two recovery processes, current technology requires threshold concentrations of 0.3 percent helium before separation of the helium is commercially feasible. For the third process, the helium is extracted from the tail gases, the gases that remain after the methane has been liquefied. The helium concentration in those tail gases is much higher than in the original gas, allowing the economical extraction of helium even through the original natural gas might contain as little as 0.04 percent helium.

Figure 2 shows the principal domestic sources of helium. Historically, most helium in the United States has been recovered using the first method described above, as

a byproduct of producing methane and natural gas liquids. Almost all of that helium has been produced in the mid-continental region around the Hugoton Field. As is described in later testimony, this is where the federal helium reserve system is located. The Hugoton Field is mature and the production of methane, NGL and secondary products such as helium from that field is expected to significantly decline over the next several years. In the last few decades, helium has been produced in Wyoming using the second method described above, where the natural gas is directly processed for its helium and other non-fuel content. Potential helium reserves have also been explored in the Four Corners area.

Outside of the United States, only small reserves of the first two sources of helium have been exploited and for many years, the rest of the world has relied upon the United States as their principal source of helium. Recently, the development of large LNG facilities has opened up new, potential sources of helium. The principal countries in which those facilities are being developed are Algeria, Qatar, and Russia, with smaller facilities coming online in Australia. These areas are expected to become increasingly more important sources of helium as the Hugoton and adjoining fields mature. See Figure 3.

Supply Chain.—After being refined, helium is transported to end users through a fairly complicated supply chain. In the United States, the helium typically is liquefied and delivered by refiners either to their transfill stations situated throughout the United States or to distributors of industrial gases. This transportation is handled using expensive domestic tanker trucks or bulk-liquid shipping containers standardized according to the International Organization for Standardization (ISO), each of which holds approximately 1.0 to 1.4 million cubic feet (MMcf) of helium. While some of the largest helium users contract directly with a refiner for their helium purchases and deliveries, most sales to end users are through the retail division of a refiner or a distributor. The refiners and distributors then repackage the helium, either in its liquid state into dewars—evacuated, multiwalled containers designed to hold liquid helium—of varying sizes or in its gaseous state into pressurized cylinders, tube-trailers, or other modules as needed by the end users.

FEDERAL POLICY REGARDING HELIUM

Helium has long been the subject of public policy deliberation and management, largely because of its many strategic uses and its unusual source. Shortly after natural gas fields containing helium were discovered at the beginning of the last century, the U.S. government recognized helium's potential importance to the nation's interests and placed its production and availability from federally owned mineral interests under strict governmental control. In the early years, helium principally was used for its lifting capability, as a safe alternative to highly flammable hydrogen. By the mid-1920s full-scale production facilities had been built and were being operated by the federal government to support its lighter-than-air aviation programs.

In the 1960s, helium's strategic value in cold war efforts was reflected in policies that resulted in the creation of the federal helium reserve. Although much of the infrastructure predates the cold war, the Federal Helium Reserve as a program began and currently consists of

- The Bush Dome reservoir, a naturally occurring underground structural dome in the Cliffside Field near Amarillo, Texas, where federally owned (and some privately owned) crude helium is stored;
- An extensive helium pipeline system running through Kansas, Oklahoma, and Texas (the Helium Pipeline) that connects crude helium extraction plants with each other, with helium refining facilities, and with the Bush Dome reservoir,
- Various wells, pumps and related equipment used to pressurize the Bush Dome reservoir, to place into and withdraw crude helium from it, and to operate other parts of the helium reserve.

The 1960s efforts also included inducements for private companies to develop helium extraction and refining facilities and to sell crude helium to the United States. The program was quite successful, resulting in the accumulation of approximately 35 billion cubic feet (Bcf) of helium by the mid 1970s. This amount was many times the 600 (750?) million cubic feet (MMcf) of helium then being consumed domestically (annually?) (globally) and so further purchases were suspended. The amount of helium maintained in the helium reserve remained fairly constant for the next 20 years.

The latest manifestation of public policy is expressed in the Helium Privatization Act of 1996 (1996 Act), which directs that substantially all of the helium accumulated as a result of those earlier policies be sold off by the year 2015, at prices suffi-

cient to repay the federal government for its outlays associated with the helium program, plus interest.

Context of Current Study.—The last section of the 1996 Act called for the Secretary of the Interior to commission a study from the National Academies to determine whether disposal of federally owned helium pursuant to the 1996 Act would have a substantial adverse effect on critical interests of the country. The report that followed (2000 Report) found that because the helium market had been quite stable since the 1980s and the price at which federally owned helium must be sold under the 1996 Act was significantly higher than the price at which privately owned crude helium was then being sold, the sell off of the helium would not have a substantial adverse effect on critical users. The report predicted that the price of privately owned crude would gradually rise to the price at which federally owned helium was being offered, and until it reached that level very little federally owned helium would be purchased, given the availability of cheaper sources.

While the helium market remained fairly stable for several years after issuance of the 2000 Report, that report did not accurately predict the market's response to efforts to sell-off federally owned helium. In March 2003, when BLM first offered federally owned helium for sale, the entire 1.6 Bcf offered for sale was purchased. Rather than gradually rising, the prices for privately owned crude helium rapidly rose such that by 2007, those prices were on par with and often exceeded the legislatively prescribed price for federally owned helium. Retail prices for helium commensurably rose, more than doubling between 2003 and 2008. In addition, during the summer and fall of 2006 and 2007, the helium market encountered widespread shortfalls, with some of the interruptions lasting for weeks at a time.

The amount of federally owned helium being sold is enormous: at the time our report was issued in 2010, it was equivalent to approximately one-half of U.S. helium needs and almost one-third of global demand. One consequence is that the price of federally owned helium, which is set not by current market conditions but by the terms of the 1996 Act, dominates, if not actually controls, the price for crude helium worldwide.

Committee Findings, Recommendations.—As mentioned at the beginning of this testimony, the principal charge of our committee was to determine whether the sell-off of the nation's helium reserve as prescribed by law has had an adverse effect on the United States' scientific, technical, biomedical, and national security users of helium. In response to this charge, the committee determined that selling off the helium reserve, as required by the 1996 Act, has adversely affected critical users of helium and is not in the best interest of U.S. taxpayers or the country. The sell-down of federally owned helium, which had originally been purchased to meet the nation's critical needs, is coming at a time when demand for helium by critical and noncritical users has been significantly increasing, especially in foreign markets. If this path continues to be followed, within the next ten to fifteen years the United States will become a net importer of helium whose principal foreign sources of helium will be in the Middle East and Russia.

In addition, the pricing mandated by the 1996 Act has triggered significant increases in the price of crude helium, accompanied by equally significant increases in the prices paid by end users. Finally, the helium withdrawal schedule mandated by the 1996 Act is not an efficient or responsible reservoir management plan. If the reserve continues to be so managed, a national, essentially nonrenewable resource of increasing importance to research, industry, and national security will be dissipated.

The committee recommends several ways to address the outstanding issues. Several of its recommendations respond to the very large impact that selling off the reserve has had and is continuing to have on the helium market in general, including a recommendation that procedures be put in place that open the price of federally owned helium to the market.

Another of the committee's concerns is that the drawdown schedule required by the 1996 Act, which dictates that the reserve helium be sold on a straight-line basis—the same amount must be sold each year until the reserve is substantially gone—is a wasteful way to draw down a reservoir. Because it is much more costly and more likely to leave significant amounts of helium unrecoverable than alternative drawdown scenarios, the committee recommends that this portion of the 1996 Act be revisited. In addition, given recent developments in the demand for and sources of helium (the principal new sources of helium will be in the Middle East and Russia, and if the sell-down continues, the United States will become a net importer of helium in the next 10 to 15 years), the committee recommends that Congress reconsider whether selling off substantially all federally owned helium is still in the nation's best interest.

The committee also addresses the needs of small-scale government-funded researchers who use helium, a group that has been hit particularly hard by sharp price rises and shortages that have characterized the helium market in recent times. This group was singled out mainly because such research is an important public enterprise and the funding mechanisms available to the researchers, typically grants on 3-year cycles for set amounts, do not allow them to respond to short-term fluctuations. These research programs should have some protection from the instabilities recently characterizing the helium market. Accordingly, the committee recommends that the researchers be allowed to participate in an existing program for government users of helium that would give them priority when there is a helium shortage. It also recommends that funding agencies help such researchers to acquire equipment that would reduce their net helium requirements. Implementing these recommendations would not subsidize such users nor would it require significant additional outlays: Indeed, over time, it would lead to the much more efficient use of the federal funds with which helium is purchased.

Because the helium market is rapidly changing and helium is critically important to many critical users, the committee includes recommendations that would facilitate long-range planning to meet the nation's helium needs, including the collection and dissemination of needed information and the formation of a standing committee to regularly assess whether national needs are being appropriately met. The remaining conclusions and recommendations consist of steps to help properly manage the helium reserve and protect this important national resource. The language of the committee's full recommendations is contained in the summary of the report, which is attached to this statement.

Finally, while noting that the question of how critical helium users in the United States will be assured a stable supply of helium in the future is beyond the scope of its charge, the committee points out that several important issues related to this topic remain unanswered. How will the large amounts of federally owned helium that remain after the mandated sell-off deadline in 2015 be managed after that date? Moreover, from a wider perspective, should a strategic helium reserve be maintained? These questions need to be answered in the near future, well before most federally owned helium is sold.

This concludes my testimony to the committee. Thank you for the opportunity to testify on this important topic. I would be happy to elaborate on any of my comments during the question and answer period.

ATTACHMENTS –

TABLE 1 Helium Uses in the United States

Category	Representative Application	U.S. Share (%)
Cryogenics		28
	Magnetic resonance imagining	
	Fundamental science	
	Industrial cryogenic processing	
Pressurize/purge		26
	Space and defense rocket purging and pressurizing	
Welding		20
Controlled Atmospheres		13
	Optical fiber manufacturing	
	Semiconductor manufacturing	
Chromatography/ lifting gas/heat transfer		7
	Chromatography	
	Weather balloons	
	Military reconnaissance	
	Heat transfer in next-generation nuclear reactors	
	Party balloons	
Leak detection		4
Breathing mixtures	Commercial diving	2

SOURCE: USGS, 2007. These data are extrapolated from data in a USGS survey conducted by BLM personnel in 2003. Current shares are not known precisely but are expected to be approximately as shown.

SUMMARY FROM SELLING THE NATION'S HELIUM RESERVE

A REPORT OF THE NATIONAL RESEARCH COUNCIL

Ready access to affordable helium is critical to many sectors in academe, industry and government. Many scientists—from individuals engaged in small-scale cryogenic research to large groups using high-energy accelerators and high-field magnets—rely upon helium to conduct their research and because the federal government supports many of these researchers, it has a direct stake in their continued success. The medical profession also depends on helium, not only for biological research in devices such as superconducting quantum interference devices (SQUIDS), but also for diagnosis with tools such as magnetic resonance imaging (MRI) devices. Industrial applications for helium range from specialty welding to providing the environments in which semiconductor components and optical fiber are produced. Government agencies that require helium include the National Aeronautics and Space Administration (NASA) and the Department of Defense (DOD), as only helium can be used to purge and pressurize the tanks and propulsion systems for NASA and DOD's rockets fueled by liquid hydrogen and oxygen. NASA and the Department of Energy (DOE) also use helium to support weather-related missions and various research and development programs funded by these agencies, both at government facilities and at universities. Finally, DOD must have ready access to helium to operate the balloon-and dirigible-based surveillance systems needed for national security.

The Federal Helium Reserve, managed by the Bureau of Land Management (BLM) of the U.S. Department of the Interior, is the only significant long-term storage facility for crude helium in the world and currently plays a critical role in satisfying not only our nation's helium needs but also the needs of the world. The federally owned crude helium now on deposit in the Reserve was purchased by the fed-

eral government as a strategic resource during the cold war. After the cold war, Congress enacted legislation (the Helium Privatization Act of 1996 referred to hereinafter as the 1996 Act) directing that substantially all of the federally owned helium in the Reserve be sold at prices sufficient to repay the federal government's outlays for the helium and the infrastructure, plus interest. The present report, called for by BLM, examines whether BLM's selling of this helium in the manner prescribed by law is having an adverse effect on U.S. users of helium and, if so, what steps should be taken to mitigate the harm.[2]

This report assesses the current status of the supply and demand for helium as well as the operation of the federal helium program. It concludes that current efforts to comply with legislative prescriptions have had and will continue to have negative impacts on the needs of both current and future users of helium in the United States. The sell-down of federally owned helium, which had originally been purchased to meet the nation's critical needs, is coming at a time when demand for helium by critical and noncritical users has been significantly increasing, especially in foreign markets. If this path continues to be followed, within the next ten to fifteen years the United States will become a net importer of helium whose principal foreign sources of helium will be in the Middle East and Russia. In addition, the pricing mandated by the 1996 Act has triggered significant increases in the price of crude helium, accompanied by equally significant increases in the prices paid by end users. Finally, the helium withdrawal schedule mandated by the 1996 Act is not an efficient or responsible reservoir management plan. If the reserve continues to be so managed, a national, essentially nonrenewable resource of increasing importance to research, industry, and national security will be dissipated.

FINDINGS AND RECOMMENDATIONS

SPECIFIC RECOMMENDATIONS FOR IMMEDIATE IMPROVEMENTS

To address these issues, the committee first lays out three specific recommendations for improving the federal helium program: changing the methods for pricing the helium being sold, committing more resources to managing the physical facilities at the Federal Helium Reserve, and providing assistance for small-scale scientists by expanding the sales program for government users to include them and promoting conservation and reuse by these users.

Pricing Mechanism

The 1996 Act set minimum selling prices, adjusted for inflation, for crude helium held by the BLM such that the sale of that helium at those prices would generate sufficient revenue to repay the federal government for what it originally spent to purchase the helium and to build the supporting infrastructure, plus interest. BLM has elected to sell its helium at those minimum prices. At the time of the 1996 Act, the minimum selling price was almost double the price being paid for privately owned crude helium. A market that had been stable for several decades prior to the sell-off of federally owned helium, experiencing neither drastic price increases nor shortages of supply,[3] began to change after BLM started to sell its crude helium. Almost immediately, privately sourced crude helium prices began to rise, and those prices continued to steadily increase so that they now meet or exceed BLM's price, and many of the sales contracts for private helium expressly tie future selling prices to BLM's price. Thus this legislatively set price for federally owned helium is now setting the price for crude helium, and there is no assurance that this price has any relationship to the current market value of that helium.

To the extent BLM's price is lower than the price the market would otherwise set for crude helium, this pricing mechanism could have several negative consequences: (1) it could lead to inaccurate market signals, increased consumption, and accelerated depletion of the Federal Helium Reserve; (2) it could retard efforts to conserve and develop alternative sources of crude helium, (3) it could result in transfers of taxpayer assets to private purchasers at below-market values—that is, it could

[2] As discussed more fully in the section of Chapter 1 entitled "Review of the 2000 Report's Conclusions," the 1996 Act called for an Academy study to determine if such disposal would have a substantial adverse effect on U.S. interests. That study, The Impact of Selling the Federal Helium Reserve, published by the NRC in 2000 and referred to hereinafter as the 2000 Report, concluded that the 1996 Act would not substantially affect matters. While several of that study's findings remain valid, it did not correctly predict how the 1996 Act would impact prices or how the demand side of the helium market would grow, in part a response to the ready availability of helium arising from the sell-off of the Helium Reserve pursuant to the 1996 Act. These factors have significantly impacted the current market for helium.

[3] 2000 Report, page 9.

amount to a taxpayer-financed subsidy for consumption of this scarce publicly owned resource; and (4) sales of federally owned crude helium could end up subsidizing exports of helium.

The managers of the Reserve should shift to a market-based pricing policy to improve the exploitation of this important national asset. The report notes that several mechanisms could be used to implement market-based pricing and thereby introduce competition, or the threat of it, to the process. However, one complicating factor is that before federally owned helium can be used, it must be refined, and the refining capacity linked to the Reserve is owned by four companies. The committee believes that market-based pricing of crude helium from the Reserve will require that purchasers other than those four companies have access to refining capacity linked to the Reserve. However, additional details on mechanisms to provide access to excess refining capacity and to attain the goal of market-based pricing of crude helium from the Reserve are beyond the committee's charge.

> Recommendation.—The Bureau of Land Management (BLM) should adopt policies that open its crude helium sales to a broader array of buyers and make the process for establishing the selling price of crude helium from the Federal Helium Reserve more transparent. Such policies are likely to require that BLM negotiate with the companies owning helium refining facilities connected to the helium pipeline the conditions under which unused refining capacity at those facilities will be made available to all buyers of federally owned crude helium, thereby allowing them to process the crude helium they purchase into refined helium for commercial sale.

MANAGEMENT OF THE RESERVE

An additional aspect of the 1996 Act that has significant—and undesirable, in the judgment of this committee—implications for the overall management of the Helium Reserve is the Act's requirement that the sale of federally owned crude helium is to take place on a straight-line basis.[4] The mandated constant extraction rate conflicts with standard practices for the exploitation of this type of reservoir, which is that production rates vary over the economic life of a deposit, typically declining over time. Declining production rates and reservoir pressures delay encroachment of water from nearby aquifers and connected reservoirs, and promote the efficient drainage and recovery of the resource gas in place.

> Recommendation.—The BLM should develop and implement a long-term plan that incorporates appropriate technology and operating practices for delivering crude helium from the Reserve in the most cost-effective manner.

ASSISTANCE FOR SMALL-SCALE RESEARCHERS

Among the events that triggered this study were the soaring prices and limited supplies that characterized the refined helium market in the fall of both 2006 and 2007. The committee, composed of individuals from a wide range of professions—economists, business people, and scientists—notes that small-scale scientists were particularly hard hit by price shocks and interruptions in the supply of refined helium during that time. An informal poll conducted by committee members of approximately 40 research programs at universities and national laboratories that use helium indicated that shortages of liquid helium interrupted the helium supply for almost half of these programs, with some interruptions lasting for weeks at a time during the late summer and fall of both 2006 and 2007. While anecdotal, these poll results provide clear indication that this community of users is directly impacted by general shortages of helium. For many of those scientists, losing access to helium, even temporarily, can have long-term negative repercussions for their research.

In general, the federal grant programs that support these researchers simply are not designed to cope with the pricing shifts and other market volatilities experienced here. The grants typically are for a two to three year period and for a set amount that does not adjust if a principal expense of research such as helium significantly increases. Further, the relatively short duration of such grants, with no guaranty of renewal, effectively precludes these research programs from entering

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[4] The law directs that crude helium from the reserve be offered for sale in such amounts as may be necessary to dispose of all helium in excess of 600,000,000 cubic feet on a straight-line basis between January 1, 2005 and January 1, 2015. Although BLM has offered helium for sale in the amounts required by the 1996 Act, not all such helium has been purchased and as a consequence significant amounts of federally owned helium will remain in the Federal Reserve after January 1, 2015. This is discussed in more detail in Chapter 5 in the section entitled "Sell-Down of Crude Helium Pursuant to 1996 Act."

into long-term contracts that might at least partially reduce the risk of significant prices increases and shortages. Further, if BLM were to implement the market-based pricing mechanism recommended in this report, the retail price for helium may commensurably increase, which will have an even greater negative impact on those helium users.

These negative impacts could, however, be mitigated at least in part through a programmatic and policy change that would allow small users being supported by government contracts and grants to participate in a program—commonly referred to as the in-kind program[5]—operated by BLM for the sale of helium to federal agencies and their contracting agents. Under that program, qualified buyers purchase their refined helium indirectly from BLM on a cost-plus basis.[6] Notably, participants in the program have priority access to helium in times of shortages.[7] The committee believes that such an expansion of the in-kind program would eliminate supply concerns and many of the price fluctuations that have negatively affected federally funded researchers during the past few years. Further, such an extension would be without significant cost to the programs supporting these researchers and, indeed, should lead to a more efficient use of the federal funds being used to purchase helium.

> Recommendation.—The crude helium in-kind program and its associated customer priorities should be extended by the Bureau of Land Management, in cooperation with the main federal agencies not currently participating in the in-kind program—for example, the National Science Foundation, the National Institutes of Health, and the extramural grant programs of the Department of Energy—to research being funded in whole or in part by government grants.

In addition to recommending that these users be allowed to participate in the in-kind program, the committee believes that the conservation and reuse of helium by these users should be promoted by the agencies funding this research. Although adopting such a policy may be costly in the short-run, the committee judges that it would save money in the long-run and would help to reduce many of the negative effects of the price and supply disruptions referred to in the preceding discussion.

> Recommendation.—Federal agencies such as the Department of Energy, the National Science Foundation, the National Aeronautics and Space Administration and the Department of Defense, which support research using helium, should help researchers at U.S. universities and national laboratories acquire systems that recycle helium or reduce its consumption, including low-boil-off cryostats, modular liquefaction systems, and gaseous recovery systems.

The committee notes that because total U.S. research applications account for only 2 to 4 percent of all usage of refined helium in the United States, the negative effects of supply and price disruptions for the U.S. research community not currently participating in the in-kind program could be addressed at relatively low cost. Moreover, in the judgment of this committee, the benefits for the nation that would accrue from minimizing these disruptions would be substantial.

GENERAL RECOMMENDATIONS FOR MEETING U.S. HELIUM NEEDS

In addition to the specific recommendations just discussed, the committee sets out more general recommendations for how to best meet the nation's current and future helium needs. These include recommendations for (1) collecting and making available the information needed to more effectively manage the Federal Helium Reserve and to formulate future helium policy, and (2) initiating strategies to develop a more comprehensive long-term program for meeting the nation's helium needs.

Collection of Information

One of the difficulties encountered by this committee and the previous NRC committee that issued the 2000 Report was the lack of timely and sufficient information to evaluate the supply and demand sides of the helium market, especially non-U.S. supply and demand, and the operation of the Federal Helium Reserve. Such infor-

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[5] The in-kind program is discussed in more detail in Chapter 5 in the section entitled "'In-Kind' Program of Crude Helium Distribution."

[6] As discussed more fully in the section of chapter 5 entitled "In-Kind Program of Crude Helium Distribution" the price is negotiated between the supplier and user and includes BLM's cost of crude helium plus refining and transportation costs and profits for the refiner and distributor.

[7] 50 U.S.C.A Section 167d (a);

mation is needed by those who formulate and carry out U.S. policies on helium in order to make good decisions.

Recommendation.—The Bureau of Land Management (BLM) should acquire, store, and make available to any interested party the data to fill gaps in (1) the modern seismic and geophysical log data for characterization of the Bush Dome reservoir, (2) information on the helium content of gas reservoirs throughout the world, including raw data, methodology, and economic assessment that would allow the classification of reserves contained in specific fields, and (3) trends in world demand. BLM or other agencies with the necessary expertise, such as the U.S. Geological Survey, should develop a forecast over the long term (10-15 years) of all U.S. demand for helium for scientific research and for space and military purposes.

Recommendation.—Unless expressly prohibited from doing so, Bureau of Land Management should publish its database on the helium concentrations in the more than 21,500 gas samples that have been measured throughout the world and provide its interpretations of gas sample analyses, especially those reflecting likely prospective fields for helium.

Long-Range Planning

Helium is critically important to many U.S. scientific, industrial, and national defense sectors. Further, the helium market is rapidly changing, as evidenced by the unforeseen developments on both the supply side and demand side of that market since the 2000 Report was released. Finally, because the Reserve is so large, steps undertaken in connection with it can have unintended consequences, the most pertinent being the effect of the pricing mechanism adopted by BLM pursuant to the 1996 Act on worldwide prices for helium. These considerations merit the development of a more permanent and sustained plan for managing this valuable resource.

In addition, the Federal Helium Reserve is a finite resource and so at some point in the future will be depleted. However, the helium needs of users in the in-kind program will continue. The BLM and the White House Office of Science and Technology Policy (OSTP) should develop a strategy to address these important future needs.

Recommendation.—The Bureau of Land Management should promptly investigate the feasibility of extending the Helium Pipeline to other fields with deposits of commercially available helium as a way of prolonging the productive life of the Helium Reserve and the refining facilities connected to it.

Recommendation.—The Bureau of Land Management (BLM) should form a standing committee with representation from all sectors of the helium market, including scientific and technological users, to regularly assess whether national needs are being appropriately met, to assist BLM in improving its operation of the Federal Helium Reserve, and to respond to other recommendations in this report.

Recommendation.—The Bureau of Land Management, in consultation with the Office of Science and Technology Policy and relevant congressional committees, should commission a study to determine the best method of delivering helium to the in-kind program, especially after the functional depletion of the Bush Dome reservoir, recognizing that this will not happen until well after 2015.

Recommendation.—The congressional committee or committees responsible for the federal helium program should reevaluate the policies behind the portions of the 1996 Act that call for the sale of substantially all federally-owned helium on a straight-line basis. It or they should then decide whether the national interest would be better served by adopting a different sell-down schedule and retaining a portion of the remaining helium as a strategic reserve, making this reserve available to critical users in times of sustained shortages or pursuant to other predetermined priority needs.

CONCLUSION

The committee notes that securing a stable and accessible helium supply in the future requires addressing several important issues that are beyond the scope of this study. For example, the legislative framework for the operation of the federal helium program is silent on the management of the Federal Helium Reserve after January 1, 2015, the mandated date for disposal of substantially all federally owned crude helium. What is to be done with the remaining federally owned crude helium?

How will BLM operations beyond 2015 be financed? Should the Reserve, either as a federal or a private entity, as appropriate, continue to exist after the BLM debt to the U.S. Treasury has been retired? While the committee supports maintaining a strategic reserve, addressing these issues requires the involvement of Congress and the broader federal science policy establishment because they go well beyond the reserve management responsibilities of BLM.

The CHAIRMAN. Thank you all. It's been very helpful.

The Federal Government has been trying to get this helium issue right since 1960, folks. Since 1960. It has just gone on and on and on.

We've seen one President after another tackle it. Let me just tell you that Senator Murkowski and I are determined now to defy the odds and actually get this fixed. So we are very much in need of your input and your counsel.

Let me just ask a few questions and then recognize my colleague.

Let me focus first on what this means for taxpayers, Mr. Spisak, because I think that has been central to this debate. In November 2012, the Department of the Interior Office of the Inspector General released a report that found BLM is not obtaining market value for Federal crude helium sales and that this is a result of a missed opportunity to raise millions of dollars in additional revenue for taxpayers. So what Senator Murkowski and I do in S. 783 is focus on a new strategy to obtain the fair market value of helium through the auction and third party market surveys.

Do you believe that this kind of approach is going to help your agency achieve a fair market price for helium and increase the return on investment of this Federal resource for taxpayers?

Mr. SPISAK. Yes. I think introducing an auction component into the sales can only improve BLM's ability to secure a better, a higher price, an increased rate of return. It should allow for more participants which will help drive up that price.

The CHAIRMAN. Now let me bring all of you into this or those who would like to participate. When most people listen to all of this, they say what's happening in the private sector? There's a government role, but why has this—to pick up on Senator Murkowski's eloquent language—not taken off in the private sector? I mean, let's get into this and unpack how this is really going to move ahead in the private marketplace.

Now, in 2010 the National Academy of Sciences said that because BLM supplies such a large portion of the market, BLM effectively sets the price for both Federal and non-Federal crude helium globally. The National Academy concluded that BLM depressed the global price for helium and this slowed the search for alternatives and new sources of helium.

So what we seek to do in S. 783 is to institute a new pricing approach that requires BLM to auction a steadily increasing percentage of its helium to make sure that the BLM price reflects the fair market value of helium.

So tell us your assessment of whether this kind of pricing approach can help stimulate production of helium, particularly in the private sector so that reliable supplies are available once the Federal Helium Reserve is depleted.

Who would like to take a crack at that?

Mr. NELSON. Certainly, Mr. Chairman, I'll attempt to answer that question.

Again, we really applaud the committee for the approach that you've taken, the wisdom of starting off with a 10-percent auction. We believe it will deliver price discovery. It will deliver that price discovery in a way that minimizes disruption in the marketplace.

So it will enable the existing helium that's in inventory to continue to be withdrawn through the allocated delivery process. It will respect the sanctity of our existing contracts. With the auction, whomever wins the auction whether it's 10 percent the first year or twenty percent the third or thirty in the early years. Provided there's priority of delivery of that helium, again, there will be more than a sufficient number of bidders that will enable you to have the appropriate price discovery that you're looking for.

The CHAIRMAN. Anybody else?

Again, the end game is private sector development. It's going to become something of a mantra with respect to this after all of these years.

Anybody else want to give their assessment?

Mr. JOYNER. Yes, Mr. Chairman, if I could add to that?

I mean the auction process, you know, surely is going to tell us what a buyer is willing to pay for that given year. The key to driving it to market price though, is the competitive factor and ensuring that the access provisions to non refiners and a broad array of buyers to participate in the auction is going to be key to arriving at a market price.

You really have to link these.

First access, the availability to purchase the volume in the ground, but then also the ability to get it delivered. Because the way the current process functions you can buy the product in the ground. But if you're not a refiner you have no delivery allocation into the pipeline.

So it's important to link those two and then link those with tolling services because it's just a piece in the assembly line. You have to pull these 3 together in order to bring other buyers to the table to generate the true market price that you're after.

The CHAIRMAN. Does the Oregonian want the last word on this?

Ms. DURAN. Intel is not in the gas production business so I don't know that we would be appropriate to comment on the pricing. Our focus is really on the continuity of supply. So one way or another knowing that BLM will run out, we need to make sure that there's a future expectation for supply.

The CHAIRMAN. Very good.

Ms. DURAN. Thank you.

The CHAIRMAN. Dr. Chan.

Mr. CHAN. I also don't, like Dr. Duran.

The CHAIRMAN. We'll let you pass.

Alright.

[Laughter.]

The CHAIRMAN. Just understand that central to this—looking back over these 50 years—people are saying what does this mean for taxpayers? What does this mean for industry? How do we move this into the private sector so that 50 years from now you don't have people sitting here having exactly the same debate?

Senator Murkowski.

Senator MURKOWSKI. Thank you, Mr. Chairman. Thank you all for your comments this morning. It's been very helpful.

Mr. Nelson, it's good to hear that you think that the legislation the Chairman and I have been working on with our staffs is one that is good. It is workable. Avoids this helium cliff that you speak of. Also for your suggestions that we might be able to further improve it.

The issue of delivery is one that you have just raised here, Mr. Joyner. But you're sitting here with a potentially complicated scenario. I guess it's not potential, it is a complicated scenario.

You've got a year's worth of helium that's in storage.

You've got additional volumes that will be allocated or auctioned over time.

There may be some interest in adding refining capacity to the pipeline.

So who gets their helium and when on a pipeline with limited and diminishing capacity will be an issue.

Mr. Spisak, how do you anticipate that the BLM will handle this going forward? Do we perhaps need to provide some additional guidance or authority here for scheduling helium delivery beyond what we have in the legislation?

Mr. SPISAK. Thank you.

The 3 phases.

The first phase where it would, kind of, continue with the transition allows us to, kind of, get through our existing storage contracts and to a place where we can set ourselves up for the start of the auction. By ramping up the auction over a multiyear period, you know, slowly at first, I believe gives us the tools to be able to make it work going forward.

Senator MURKOWSKI. OK. So you don't think we need to add anything further in terms of guidance? You're good with it?

Mr. SPISAK. As far as the volumes and such I think there's enough flexibility in there to be able to allow us to do what we need to do.

Senator MURKOWSKI. OK.

It's our understanding that there have been some attempts in the past by small, mobile refining interests to gain access to the Federal helium pipeline and that those requests have been turned down by BLM.

Can you just confirm whether or not this is the case?

If so, why any entities that might be seeking access would be denied?

Mr. SPISAK. I am not aware of any specific case where a company was denied access to the pipeline. Generally there are cost requirements and related to connecting. But that shouldn't be an obstacle. It's more tied to the capital investment associated with bringing the pipeline and the location of where the resources are.

There are a number of private pipelines that are connected to the Federal operated pipeline. We've accommodated those in the past. I know there are several smaller operations that we're actually working with in Utah, primarily, where they're using small recover units. They're in the early stages of that development.

But it's primarily that the relationship of how close the resource is to the pipeline. If it's too far away it wouldn't make sense to

build the capital investment of putting in a pipeline to make the connection.

Senator MURKOWSKI. So do you feel that there is any ambiguity with the Secretary's authority to consider granting new access to the pipeline? Is that something that we might want to consider with our language?

Mr. SPISAK. The issue that may have kept some people out of the existing storage contracts convey a priority to the existing refining capacity as of a date in 2000. With the direction in this bill, I think it's clear that at the point when the storage contracts would be renewed in October 2015, that we be working to remove that priority so anybody that wishes to refine and connect up to the pipeline they can do so.

Senator MURKOWSKI. I think they could.

Mr. JOYNER. Senator.

Senator MURKOWSKI. Yes, Mr. Joyner.

Mr. JOYNER. If you would. Just a little context around that delivery issue and how it's working in practice. I appreciate you bringing it up because it's a key point of the legislation that's yet to be addressed in addition to these purchase volumes.

Because what happens today is when you purchase this volume and the delivery policy is upstream of that or such that only refiners can take delivery. So what you're buying something, but you have no ability to take delivery to us. You have no delivery scheduling from the BLM. That's not addressed in the legislation.

The way the current policy results, a good example is one of our competitors, Matheson Tri-Gas, testified to the House. They bought millions of feet of product years ago and have had no ability to extract that product. They can't get it delivered from the BLM to the infrastructure. They cannot get it tolled. So they have this stranded helium issue.

So it's key that legislation address an equivalent delivery scheduling for the product in addition to just opening up access for other buyers to purchase it. Otherwise you'll be left with the same system whether it's new refineries or other buyers. You can't get access to the product unless it's addressed in this legislation.

Senator MURKOWSKI. So you think that we need to clarify with some language there?

Mr. JOYNER. Absolutely. Otherwise it's just going to continue what is happening in the, kind of, closed system environment today.

Senator MURKOWSKI. OK.

Then just one quick question for you, Dr. Chan. I'm told that some Federal users may be getting a smaller volume of helium than they had anticipated receiving. I think this is probably consistent with the global shortage that we're seeing in the delivery reduction to private users.

I'm just trying to understand the situation here. Are Federal users receiving less helium than they signed up for? Do you think this is consistent with the contracts and other measures in place related to those transactions?

Mr. CHAN. I'm not aware in the last few years that there is any shortage in receiving the helium.

Senator MURKOWSKI. Is anybody else familiar with that?

Dr. Duran.

Ms. DURAN. I can say from an industrial, not a Federal grant, from an industrial perspective we have seen shortages. We have had to up our ante on our conservation and make choices about how we use it within the semiconductor industry specifically.

Senator MURKOWSKI. OK.

None necessarily within the Federal users, if you will, just the overall.

Ms. DURAN. Right.

Senator MURKOWSKI. Global shortages that we're anticipating.

Ms. DURAN. I would say from a Federal perspective having gone to graduate school and used helium in my research as well. The price is a big deal.

Mr. CHAN. Yes.

Ms. DURAN. Especially when you look at the reduced funding that's going to Federal research grants. When you look at that and the increased price that Dr. Chan discussed than you are making choices about the experiments you can run. So it's maybe a self induced shortage driven by price, frankly.

Mr. CHAN. With that, I definitely agree.

Senator MURKOWSKI. Good. Good.

Thank you, Mr. Chairman.

The CHAIRMAN. Just one other question on this issue with respect to tolling.

Now, Mr. Nelson, according to the data that was provided in the 2010 Academy study there's over a billion cubic feet of excess refining capacity connected to the BLM pipelines. So under our bill excess capacity would be made available at commercially reasonable rates to refine helium and, of course, to purchase at auction. Without a way to refine the auction of helium, it's unlikely it would be a genuine auction.

Can you tell the committee among the refiners connected to the Federal pipeline how much excess refining capacity is available now?

Mr. NELSON. Certainly, Mr. Chairman.

Again, the tolling provision is certainly one of the more controversial pieces of the bill. Again, tolling is the process whereby the refiners would effectively relinquish a portion of their refining capacity to process crude helium for someone who does not have refining capacity. The refiners have historically tolled for non refiners or for end users when there is capacity available.

It's more than just the capacity that's available in the refining plants. Mr. Chairman, I would conclude again, I'm not privy to the specific capacities of my competitors. So I would have to defer to the report of the NAS study that is probably as close to the possible to be correct.

But it's more than just the refining capacity of the plants. It's the capacity of the system. We don't have the ability to toll today because the system is at capacity. The BLM system is effectively oversubscribed. We don't have the ability to move any molecules into our plant even though we may have capacity to toll.

The third piece, of course, for any tolling to take place is there needs to be commercially reasonable terms under which two parties would agree to enact a tolling activity.

The CHAIRMAN. Same question for you, Mr. Spisak.

Mr. SPISAK. Mr. Nelson's point about the system capacity, I think, is right on the mark. The field as time goes on can only produce a certain amount of gas. As time goes on it's less and less.

There's also the pipeline system that takes gas produced from the Hugoton Gas Field, that midcontinent area and that's also going through decline. So the amount of crude helium available from the system is going down. But the helium refining capacity is virtually the same.

So as time goes on there's a larger and larger mismatch. So that's why there's some interest in trying to, you know, bring additional molecules into the system. But if they're far away, like in Utah, it wouldn't make sense to build a pipeline that far to ship that gas.

So that's the mismatch that is occurring. It's making it difficult for companies to toll helium.

The CHAIRMAN. Alright. Let's see. We want to find the whereabouts of Senator Barrasso at this point, a very fine member of our committee.

Time out here for a little logistics planning.

What we're going to do is since Senator Barrasso has a lot of expertise on these kinds of policy issues, we're going to hold the hearing record open so that he can pose his questions in writing.

We intend to work very closely with him and do this in a bipartisan way.

You all have been helpful. I mean, literally, looking back at the fact that this debate started before a whole lot of people in this room were even born is an indication how important it is to get this right.

So I thank you all for your patience. You've given us a lot of good suggestions. You'll be getting a number of questions from Senators for a response in writing.

We thank all of you for your attendance today.

The committee is adjourned.

[Whereupon, at 10:25 a.m. the hearing was adjourned.]

APPENDIXES

APPENDIX I

Responses to Additional Questions

RESPONSES OF TIMOTHY R. SPISAK TO QUESTIONS FROM SENATOR WYDEN

Question 1. In 2010, the National Academy of Sciences noted that because BLM supplies such a large portion of the market BLM now effectively sets the price for both Federal and non-Federal crude helium globally. NAS concluded that BLM depressed the global prices for helium and that this has effectively slowed the search for alternatives and new sources of helium. S.783 addresses this issue by instituting a new pricing mechanism that requires BLM to auction a steadily increasing percentage of its helium to make sure that the BLM price reflects the fair-market value of helium. Do you think this new pricing system will help to stimulate production of helium by private natural gas producers so that reliable domestic supplies are available once the Federal Helium Reserve is depleted?

Answer. Yes, the BLM believes that increases in the helium price using the new pricing system will help to stimulate production of helium by private natural gas producers and lead to a reliable domestic supply of helium.

Question 2. Under both the Senate and the House bills it's clear that the BLM will be getting out of the commercial helium business once and for all. (In both bills, commercial sales halt when BLM has drawn down the Reserve to 3 billion cubic feet. This remaining helium would be kept only for future Federal use.) It is my understanding that only a limited amount of helium can be extracted from the Reserve every year just because of the mechanics of the system. How many more years of commercial sales would you estimate are left before BLM hits the 3 billion cubic feet target proposed in both the House and Senate bills? And how many more years until no additional helium can be extracted even for Federal use?

Answer. Counting all sources of helium in the Reserve (both conservation helium and helium in the native gas), it will take about five years to reach 3 billion cubic feet (Bcf). Once the 3 Bcf level is reached, about three more years' worth of helium could be extracted for Federal use without facility investments. With facility investments, delivery for Federal use could last up to seven years after the 3 Bcf threshold. Facility investments include increased compression and retooling of the crude helium enrichment unit to allow for a lower production flowrate from the crude helium enrichment unit. In addition, it is possible that the current facility would need to be replaced with a smaller facility.

Question 3. Do you believe the BLM has sufficient tools and legislative authority under S.783 to assess the amount of excess refining capacity available at individual refineries? What would the practical implications be of modifying "excess refining capacity" in S.783 to mean "operational" and "non-contracted" refining capacity on the ability of non-refiners to obtain tolling agreements?

Answer. Yes, the BLM believes it would have sufficient tools and legislative authority under S. 783 to assess the amount of excess refining capacity available at individual refineries.

Excess refining capacity of any particular plant would not be beneficial if the amount of helium being produced out of Cliffside and the rest of the Mid-Content Area is below the total capacity of all plants on the pipeline. Based on the continuously increasing demand for helium and declining production and delivery rates from Cliffside, it is unlikely that the total helium refining capacity for all plants on the pipeline will be met. However, the proposed modification to S. 783 is beneficial in that it specifically refers to the refining capacity in a plant that is above a com-

pany's capacity requirements and takes into consideration the total output from Cliffside.

RESPONSE OF TIMOTHY R. SPISAK TO QUESTION FROM SENATOR MURKOWSKI

Question 1. One of the concerns that we have heard from a variety stakeholders is that any delays in BLM implementation of the bill we are considering could disrupt the supply chain for helium. We have built in a grace period of approximately one year for BLM to get its ducks in a row and included language to provide options for BLM if the agency falls short in some way regarding implementation. But obviously we want the legislation implemented in a timely way, once it is enacted.

Are you confident that BLM can complete the work needed to implement this bill in the amount of time that we have provided to do so?

Answer. Yes, the BLM believes that a time frame of approximately one year will be sufficient to implement the bill.

RESPONSE OF TIMOTHY R. SPISAK TO QUESTION FROM SENATOR BARRASSO

Question 1. In 2010, the National Academy of Sciences issued a report which found that the Bureau of Land Management (BLM) has been selling crude helium from the Federal Helium Reserve at below-market prices.

In November of 2012, the Department of the Interior's Inspector General stated that: "BLM does not have the capability needed to identify and maintain market value prices for its helium reserve." The Inspector General explained that: "Without changes to the program, there is no assurance that BLM's. . .helium sales. . .will be made at market value."

BLM's below-market prices have not only short-changed American taxpayers but they have also discouraged investment in alternative sources of helium such as those in Wyoming, which has over 50 percent of the nation's helium reserves. It will be increasingly important that we develop these alternative sources of helium as the Federal Helium Reserve winds down.

Does S. 783 give BLM all the tools it needs to sell helium from the Reserve at market value? If not, what additional tools does BLM need in order to sell helium from the Reserve at market value?

Answer. The BLM believes it would have most of the tools it needs to sell helium from the Reserve at market value. However, a provision that authorizes the Secretary of the Interior to levy penalties on entities that do not provide the required information could be useful to ensure full compliance.

RESPONSE OF MOSES CHAN TO QUESTION FROM SENATOR MURKOWSKI

DELIVERY OF FULL VOLUME

Question 1. I am told that some federal users may be getting a smaller volume of helium than they had anticipated receiving. This would be consistent with the global shortage we've faced and delivery reductions to private users, but I wanted to raise the issue and gather additional information from you if I could. Are federal users receiving less helium than they signed up for, and do you think this is consistent with the contracts and other measures in place related to those transactions?

Answer. I am happy to answer your question. In the summer of 2012, scientists in universities and National labs experienced wide spread, late, and sometimes canceled shipments of liquid helium. The shipments were often rationed; they did not get the full amount they ordered.

Some but not all of the 29 Universities that experienced difficulty were registered with the Bureau of Land Management (BLM) for the In-Kind program. It is my understanding that all the National Labs are enrolled in the In-Kind program. Because Federal users and grantees are entitled to priority supply under that program, reducing allocations to In-Kind program users implies a breach of the contracts signed by the vendors with BLM.

I would also like to bring to your attention to a related issue. Since late last year, many, if not all the universities that buy liquid helium have registered for the In-Kind program. However, there is evidence that many of the In-Kind users are not being helped by the "cost plus" concept. In fact, many of the In-Kind university users have been informed of a dramatic price increase of nearly 100%—from ~$7.50 a liter to ~$15.00 a liter between 2012 and 2013. The raw helium price (equivalent to less than $2.00 a liquid liter) sold to the vendors by BLM over the same time period increased by no more than 5%. We do not understand how such price increase can be consistent with the In-Kind program.

RESPONSES OF CAROLYN DURAN TO QUESTIONS FROM SENATOR BARRASSO

Question 1. One of the principal purposes of S. 783 is to provide helium end-users, such as Intel, access to the Federal Helium Reserve. The bill would establish an auction process whereby the prevailing party at the auction would be able to have its crude helium refined at commercially reasonable rates. Do you expect that Intel and other helium end-users will participate in the auction process?

Answer. I cannot predict whether Intel or any other end-user will participate in the auction process. Because of its unique properties, helium can be challenging to store and ship, and end-users typically lack expertise in the management of helium. Nonetheless, the end-user community would like to ensure that helium legislation provides the option for end-users to participate in an auction as a means of facilitating a more competitive market for helium.

Question 2. The House recently passed a helium bill (H.R. 527) which establishes a very different auction process than the Senate bill. From your perspective, which auction process is likely to encourage greater participation among helium end-users?

Answer. It is unclear whether end-users would participate more in an auction under either of the differing versions of the bill. Because individual end-users comprise only a very small portion of the overall helium supply, it seems likely that end-users could participate in the auction under either approach.

Question 3. The Federal Helium Reserve provides about 30 percent of the world's supply of helium. However, production at the Reserve is in significant decline. Moreover, the House and Senate bills would shut off the private sector's access to the Reserve once it is drawn down to 3 billion cubic feet. At that point, only Federal users, such as the Department of Defense and NASA, will have access to the Reserve. It is estimated that the Reserve will reach 3 billion cubic feet within the next 7 years. If helium end-users can't find alternative supplies in sufficient quantities, will Intel ask Congress to give it and others access to the helium set aside for Federal users?

Answer. Our understanding is that other sources of helium supply are expected to come on-line around the world in the next several years. In addition, many end-users are investing in helium conservation and recycling, as well as the identification of alternatives to the use of helium in some applications, in order to reduce the overall need for helium. Under these circumstances, we anticipate that end-users will not require access to the helium in the Reserve once it is drawn down to 3 billion cubic feet. This legislation is critical as a near-term solution to the shortage in the helium supply, and other measures must be implemented by the private sector to provide for a long-term solution.

Question 4. Dr. Chan explained in his written testimony that helium can be extracted: (1) directly as is done in Wyoming; (2) as a byproduct of methane production; or (3) during the production of liquefied natural gas (LNG). The concentration of helium must be at least 0.3 percent for it to be economic to extract helium directly or as a byproduct of methane production. However, the concentration of helium need only be 0.04 percent for it to be economic to extract helium during the production of LNG. As a helium end-user, does Intel view the prospect of LNG export terminals here in the United States as a positive step toward ensuring sufficient domestic supplies of helium?

Answer. I do not have expertise in issues such as the helium extraction process, the concentrations of helium that must be present for economic extraction, or the production and export of liquefied natural gas. Accordingly, I cannot opine on whether LNG export terminals would be a positive step toward ensuring sufficient domestic supplies of helium.

RESPONSE OF DAVID JOYNER TO QUESTION FROM SENATOR MURKOWSKI

Question 1. There is already a years-worth of helium in storage. Additional volumes will be allocated or auctioned over time. And there may be interest in adding refining capacity to the pipeline. This makes for a complicated scenario, in terms of who gets their helium and when on a pipeline with limited and diminishing capacity. How do you anticipate the BLM will handle this issue going forward and do we need to provide additional guidance or authority for scheduling helium delivery in the legislation we are considering today?

Answer. Yes, Congress needs to provide additional statutory guidance to BLM for scheduling helium delivery in S. 783. For the reasons set out below, we recommend including legislative language that ensures that pipeline access is granted in equivalent volumes to any person who has acquired crude helium after the date of enactment.

This question gets to the heart of whether the provisions being advocated in S. 783 are successful in bringing about positive changes to the way the Federal Helium Reserve (the "Reserve") is managed. As we discussed at the May 7th hearing, the three companies that operate helium refineries on the Federal Helium Pipeline (the "Refiners") currently receive close to 100 percent of the federal crude helium released each year from the Reserve. This captive control of a taxpayer-owned resource means less competition, less security of supply for end-users, and less return for U.S. taxpayers. Additionally, we remain concerned that S. 783's language relative to existing agreements potentially allows this closed system to remain in place. To remedy this situation, S. 783 rightly includes the first essential step: a conditional tolling provision to open up access to this closed system and encourage the Refiners to enter into tolling agreements with outside parties who purchase federal crude helium. This provision is consistent with the market-based approach recommended by the National Research Council in its 2010 Report on the Reserve.

While the tolling provision in S. 783 is vital, it will only accomplish the Committee's goals if S. 783 also provides a second vital step: guidance and authority on BLM's ability to schedule helium deliveries. Under the current delivery system, which I anticipate BLM will likely continue to follow, BLM provides 100 percent of the annual delivery allocations in the Federal Helium Pipeline to the Refiners. As a result of these internal BLM decisions, past purchasers of federal crude helium, who already have product stored in the Reserve, have been unable to get delivery of such product into the taxpayer's pipeline system. To remedy this fatally flawed situation, any purchased volumes of crude helium, whether under the current allocation system or as part of the new auction process, must come with equivalent, dedicated delivery volumes on the Federal Helium Pipeline to a refinery chosen by the buyer. If this language is not included, then non-refiners could once again find themselves with product they have purchased in the ground but with no way to take delivery of that product. At the May 7th hearing, I referred to this as "stranded helium." If, however, S. 783 connects volumes purchased with dedicated delivery volumes on the pipeline, the Refiners would not be allowed to control this delivery volume for their own captive interests. The Refiners would then have a commercial interest to engage in tolling agreements for these ancillary volumes and receive appropriate tolling fees for the service.

Finally, it is important to note that this arrangement is modeled on the existing and successful federal in-kind program which allows federal users to receive bids for their needs from a variety of sources. This program has linked product from the Reserve with delivery allocations on the Federal Helium Pipeline and, accordingly, the system has worked in the way it was intended. I would urge the Committee to look at this example and ensure that the broader access and greater competition sought by S. 783 can be similarly successful.

RESPONSE OF WALTER L. NELSON TO QUESTION FROM SENATOR BARRASSO

Question 1. In your written testimony, you state that: "[H]elium supplies will continue to remain tight until new helium production begins in Algeria, Qatar, and. . . Wyoming later this year." You explain that projects in Algeria, Qatar, and Wyoming will collectively increase global helium supply by as much as 24 percent. However, you go on to say that: "new sources of helium will still be required to offset BLM supply declines over the next 10 years and beyond." Would you elaborate on the importance of developing alternative supplies of helium, such as those in Wyoming?

Answer. Part 1) Global helium demand growth rates are expected to be within the historical range of 3-5% per year going forward. At these growth rates, approximately 200 million cubic feet per year of new helium volume will be required each year. In addition, the BLM supply is declining approximately 18% per year, and commercial sales of BLM helium will end by 2020. New helium source volumes of approximately 200 million cubic feet per year must also be brought on-stream each year (globally) in order to replace the declining BLM volumes—in total approximately 400 million cubic feet per year of new helium volume will be needed each year to satisfy forecasted demand. The announced helium projects in Algeria, Qatar and Wyoming will collectively add approximately 1.8 billion cubic feet of helium into the market later this year. These new announced helium supply volumes will more than satisfy global demand for the next five to seven years through 2020, after which time additional helium volumes will be required if global demand continues at the similar rates.

Part 2) The LaBarge and Riley Ridge fields in WY contain the largest proved and unproved helium reserves in the United States other than the Hugoton field in and

near the Texas panhandle. ExxonMobil is currently producing approximately 1.3 billion cubic feet per year from LaBarge, and at these rates the LaBarge field could continue to produce helium for decades. According to BLM and NAS reports, the Riley Ridge area of Wyoming is also estimated to contain large volumes of helium. This helium is contained in low-quality natural gas that is not currently being produced. Denbury Resources is expected to start-up a new natural gas processing plant on Riley Ridge later this year, and that plant will produce approximately 200 million cubic feet per year of helium. The Denbury plant is expected to double its rates by 2017. The Riley Ridge field is potentially large enough to support a doubling or tripling of the expected Denbury helium production in the future if the CO_2-rich gas is exploited for enhanced oil recovery (EOR). Like the LaBarge field, Riley Ridge could potentially produce helium for many decades.

APPENDIX II

Additional Material Submitted for the Record

APPENDIX A.—INDIVIDUAL COMPANY STATEMENTS OF AIRGAS, INC., AIR LIQUIDE HELIUM AMERICA, INC., AND MATHESON TRI-GAS

STATEMENT OF AIRGAS, INC.

Helium is a vitally important strategic resource with numerous scientific, manufacturing, and industrial applications. The United States taxpayer-owned Federal Helium Reserve currently provides over 40 percent of the domestic supply and roughly 30 percent of the global supply, and therefore must continue to operate in order to avoid a significant market disruption. The recently introduced "Helium Stewardship Act of 2013" (the "Act") takes some important steps to address many seriously-needed changes to the operation of the Reserve. As the largest domestic distributor of helium in the U.S., Airgas, Inc. believes that with some revisions to promote more meaningful access and competition, the bill can be strengthened to provide for a more stable supply of the resource and an improved return to the taxpayer.

Founded in 1982 and headquartered in Radnor, Pennsylvania, Airgas operates the largest domestic infrastructure and supply chain for delivering helium in the United States, with more than 80,000 customers accounting for 22 percent of the domestic market. We are therefore in a unique position to attest to both the vital role that this limited resource plays in our economy, and the disruptive effects that the current sales regime is having on our customers. Along with Air Liquide and Matheson Tri-Gas, we are considered the "non-refiners" in this debate, and together we supply roughly 40 percent of the domestic helium market. Therefore, our interest in this legislation is profound and our ability to compete on a level playing field is critical to the security and improved stability of supply for the end-use community.

Before addressing the new legislation, it is important to understand how the current situation developed and why the sales regime must be overhauled. As the Committee knows well, the Helium Privatization Act of 1996 established a pricing mechanism based on debt repayment instead of the commodity's market value, and a sales construct whereby the taxpayer-owned crude helium can effectively only enter the marketplace after first being allocated to one of the four companies (one of which has contracted its output to one of the refiners) with pre-existing refining facilities on the BLM pipeline. Taken together, the manufactured price and the restricted access to the resource created a warped situation and the domestic end user community and the U.S. taxpayer are suffering the negative supply and pricing consequences.

In reviewing operations of the Reserve, a 2010 report from the National Academy of Sciences' (NAS) National Research Council (NRC) stated, "The managers of the Reserve should shift to a market-based pricing policy to improve the exploitation of this important national asset."[1] The report goes on to state, "[h]owever, one complicating factor is that before federally owned helium can be used, it must be refined, and the refining capacity linked to the Reserve is owned by four companies. The committee believes that market-based pricing of crude helium from the Reserve will require that purchasers other than those four companies have access to refining capacity linked to the Reserve."[2]

We applaud the authors of the recently introduced Act for agreeing with the National Academy addressing the serious inequities resident in the current BLM Federal Helium Reserve Sales Program. In particular, we appreciate the effort to pro-

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[1] Committee on Understanding the Impact of Selling the Helium Reserve; National Materials Advisory Board; National Research Council; National Academy of Sciences. 2010. "Selling the Nation's Helium Reserve." Page 8.

[2] Ibid.

vide increased access for non-refiners, the vitally important transparency provisions, and the recognition that mandatory tolling services are a requirement for any alternative sales regime to be effective.

However, as a general proposition, we are concerned that this Act adopts a number of anti-competitive, refiner-friendly provisions that more than likely will cause the bill's most important goals to go unrealized. Recognizing the fact that, as of the most recently published BLM Storage Information, there are 12,374,626,000 cubic feet of helium in storage of which 10,819,156,000 cubic feet (about 88 percent) is taxpayer-owned and 1,505,486,000 cubic feet (about 12 percent) is privately owned and that helium is being removed from storage at the rate of approximately 2 billion cubic feet per year, the combination of (i) delaying implementation of Phase B until October 1, 2014, (ii) providing for a painfully slow ramp up in the amount of helium available for purchase by qualified bidders (10 percent beginning October 1, 2014 increasing by 10 percentage points each year thereafter), and (iii) requiring refiners to refine for others only to the extent they have "excess refining capacity", means that by the time non-refiners are given meaningful access to the taxpayer-owned helium, little if any of that helium will remain to be purchased and the goal of facilitating a competitive market-based sales regime will go unachieved.

With those challenges in mind, we offer the following recommendations which we believe will enable the Act's good ideas and intentions to become real world, market-driven solutions.

SALES OF CRUDE HELIUM

Regrettably, as currently constructed, the Phase A Allocation Transition will not facilitate meaningful access or competition for the helium resources. Though we do not understand the interest in continuing a preferential allocation regime which has benefited only three companies at the expense of the rest of the industry (and the end-users), we have nonetheless sought to make recommended changes within the confines of the legislation's structure. Presumably, the idea of a transition is to bring fairness, competition, and market forces into play over a time frame that is least disruptive to the market. Unfortunately, a drawn out transition with limited access to minimal volumes for a declining resource is effectively no transition at all and instead represents a continuance of the status quo.

The bill proposes that the auction mechanism not begin until October 1, 2014. In the absence of any changes to the current allocation methodology, between now and then another 2 to 3 billion cubic feet of helium will be allocated to the refiners. That leaves only 4-5 billion cubic feet (allowing for the 3 billion cubic feet reserved for Federal Users) available for disbursement under the new regime contemplated in the Act. Given the reduced volumes, and considering that with every reduction in volume there is a reduction in pressure and a commensurate increased difficulty in extracting future molecules, the Phase A Allocation should end much sooner and the transition to the auction period should be accelerated.

Regarding the auction, we believe a fair and effective bill would facilitate a regime more reflective of the domestic market-share, wherein 50 percent of the auctioned volumes would be reserved for the refiners, and the other 50 percent would be auctioned off to qualified participants other than the refiners. Any available amounts not acquired by the refiners would be available to non-refiners and after the non-refiners auction, any remaining amounts would again be made available to the refiners. Keeping in mind that the refiners have benefited greatly through the years thanks to their guaranteed allocation, it should not be too much to ask that a percentage of the available resource reflecting the rest of the marketplace be subject to meaningful competition between parties other than the refiners who will nonetheless continue to receive a guaranteed set-aside.

Given the limited and diminishing resources, it is vitally important to make available significant volumes of helium as early in the process as possible, otherwise the goal of achieving market reform will not be realized. We believe that such a program will enable fair competition, rigorous participation, a superior return to the taxpayer, and a vastly improved security of supply for domestic end-users.

CONDITIONAL TOLLING REQUIREMENT

We applaud the sponsors of the Act for supporting the National Academy's recommendation to facilitate the availability of tolling services for the non-refiners. In the absence of such a requirement, all alternative regimes to the current status quo will fail because of the inability of non-refiners to secure tolling agreements on a commercially reasonable and non-discriminatory basis.

Unfortunately, we believe the current language in the bill will allow the refiners to avoid providing services to non-refiners by claiming they do not have excess refin-

ing capacity. Therefore, we believe that as a condition of sale to a refiner, the refiner must make sufficient refining capacity of helium available to non-refiner parties prevailing in auctions under terms that are just, reasonable and non-discriminatory (both commercially and with respect to the operational delivery of helium to non-refiners) The specifics of how to define sufficient capacity could be relegated to BLM rulemaking, but one option would be to define it as a percentage of a refiner's refining capacity that is not less than the percentage of its capacity represented by the helium it purchases from the BLM. For example, if a refiner's BLM purchases of helium represent 20 percent of its capacity, that refiner should make at least 20 percent of its capacity available to non-refiners.

We believe strongly that in the absence of a strengthened (and more operationally representative) definition of available/sufficient refining capacity, the auction mechanism will not be effective and a primary goal of the legislation will go unmet.

CONTRACTS

As currently written, the bill extends special treatment to some of the BLM contracts held by the refiners. Not only would such treatment disregard the legal conditions resident in each contract related to contingencies based upon requisite congressional authorizations and appropriations, but it would also gut the intent of the legislation to create a fairer, more competitive, and more transparent federal helium sales regime. A similar provision was overwhelmingly rejected by the full House of Representatives, and we steadfastly oppose any attempt to include such detrimental and anti-competitive language.

HELIUM PURCHASE LIMIT AND REMOVAL FROM STORAGE

Lastly, we believe a new paragraph should be added to Section 5 to direct that no winning bidder may purchase more than 30 percent in the aggregate of the helium sold at an annual auction and to require that such helium be promptly removed from storage. This will further facilitate competition, prevent hoarding, and ensure that the end-use community has the ability to compete and choose from among a more diverse group of qualified suppliers.

For nearly two decades the helium industry, the end-use community, and the taxpayer have suffered under a monopolistic regime that led to supply shortages and market distortions. The "Helium Stewardship Act of 2013" is a commendable attempt to correct a fatally flawed privatization process from 17 years ago and we applaud the sponsors' efforts to right a wrong. With the addition of our recommended changes, we believe the Act will succeed in achieving its goals of fairness, competition, and an improved return to the taxpayer. Given the opportunity to compete for the nation's helium resources, Airgas, along with others in the industry who are currently excluded from the process, will readily participate in the auction and potentially invest in new capital projects associated with the open market; and, by delinking the Reserve helium from the artificial pricing mechanism, Congress can unlock additional investment in private sector helium development which is otherwise reluctant to engage in a distorted market. If Airgas is successful in competing for some of the nation's helium resources, its domestic packaged helium supply chain would be able to more fully meet the requirements of U.S. businesses.

By increasing market competition, allowing commercial forces to take root, and enabling private sector judgments to spur economic development and greater investment, an amended version of the Helium Stewardship Act of 2013 will greatly benefit the industry, the end-user community, and the American taxpayer.

STATEMENT OF DAVID JOYNER, PRESIDENT, AIR LIQUIDE HELIUM AMERICA, INC.

Chairman Wyden, Ranking Member Murkowski, and Members of the Committee, I appreciate the opportunity to testify today on S. 783: The Helium Stewardship Act of 2013 and generally on issues relating to the domestic helium industry and the Federal Helium Reserve. My name is David Joyner, and I am the President of Air Liquide Helium America, Inc., the helium company for American Air Liquide, one of the Nation's leading industrial and medical gas companies. Headquartered in Houston, Texas, Air Liquide has over 5,000 U.S. employees in more than 200 locations throughout the country. For decades, Air Liquide has offered industrial and medical gases and related services to the Nation's largest industries including manufacturing, electronics and healthcare. As a company, Air Liquide is focused on technological innovation to help make our Nation's manufacturing and industrial sectors more efficient, environmentally friendly and productive.

I have been with Air Liquide working in the industrial gas sector for over twenty years, most recently as President of Air Liquide Helium America. In this role, I have gained an appreciation for the complexities of the helium market as well as

the importance of helium to a variety of end-users. At the outset, I want to commend and thank you all for your hard work and that of your staff in considering this important issue and in crafting legislation to extend the operation of the Federal Helium Reserve. It is Air Liquide's highest priority to assist you in continuing the operation of the Federal Helium Reserve in a manner that creates a stable and reliable helium supply capable of supporting the needs of end-users as well as providing an appropriate and reliable return on a Federal resource for U.S. taxpayers.

Air Liquide is a major supplier of refined helium in the United States and globally to customers that range from companies on the cutting edge of the electronics industry to health researchers, automotive suppliers, laboratories and manufacturing facilities all over the world. When Congress passed the 1996 Helium Privatization Act (the 1996 Act), it was expected that the supply of crude helium in the Federal Helium Reserve would last until 2015 and the Act along with any associated contracts would end. It is now possible that the Federal Helium Reserve's supply of helium could last much longer if properly managed. Despite the amount of remaining helium, the funding mechanism in the current law could lead to the closure of the Federal Helium Reserve in the Fall of 2013. This closure would effectively take close to a third of the global supply and half of the domestic supply of helium offline, creating shortages and substantially increasing the cost of helium for end-users. Accordingly, your actions on this legislation are critically important as Congress must act in order to ensure access to the helium remaining in the Federal Helium Reserve.

A stable supply of helium is important to our Nation's economy as it is a vital component in products ranging from magnetic resonance imaging (MRI) machines to airbags for the automotive sector. Helium is also important to our Nation's security as it is used in a variety of military and defense surveillance programs. Finally, the reliability of our helium supply is important for the Nation's research efforts such as those being undertaken at our Nation's national laboratories and at our own Delaware Research and Technology Center. These important efforts would be threatened by any sustained shortage in the domestic helium supply, particularly one that can be largely avoided by responsible management practices.

As we work together to extend the operation of the Reserve, it is also important to consider what changes can be made to create a more open and competitive helium market that would improve reliability and benefit end-users. To that end, I would like to focus on two specific issues as S. 783 is considered: (1) accessibility; and (2) global price impact and qualified bidders.

I. INCREASING ACCESS AND CREATING A MORE COMPETITIVE AND TRANSPARENT MARKET FOR FEDERAL CRUDE HELIUM

A. Background on the Federal Helium Reserve

As the Committee is aware, the helium stored at the Federal Helium Reserve and sold to private industry is "crude" helium which must first be separated from natural gas and then refined (i.e. "tolled") into liquid before it is transported to other facilities around the country for additional processing and then on to end-users. The process resulting in refined helium involves the BLM separating the crude helium from the natural gas in the Federal Helium Reserve, transporting the crude helium from the Federal Helium Reserve through the Helium Pipeline—a system that runs through Kansas, Oklahoma, and Texas—to one of six refining facilities that are located on the pipeline. These six refining facilities are owned by just four[3] companies and were established by those companies in the last century to take advantage of privately-owned crude helium supplies. In fact, these refineries were built up to 31 years before the 1996 Act and prior to any expectation of a future government decision to sell crude helium from the Federal Helium Reserve to private industry. Nevertheless, with the enactment of the 1996 Act and the resulting use of the federal government's infrastructure to sell crude helium from the Reserve, these companies gained the unexpected windfall advantage of controlling access to the public's stockpile of crude helium due to their preexisting refineries.

B. Air Liqude Supports Conditional Tolling Agreements

Air Liquide is a so-called "non-refiner" on the BLM system and, as such, we must contract with the Refiners—who are also our competitors in the sales market—to be able to distribute any helium purchased from the BLM. Without such "tolling" contracts, non-refiners are effectively prohibited from utilizing the BLM source. In

[3] While there are four companies who operate refineries on the federal pipeline, one of those refiners solely supplies one of the other three companies. Effectively, there are three companies who operate refineries on the federal pipeline.

recent years, the BLM has contractually committed 94 percent of the captive deliverable volumes to these refineries. The remaining six percent has been allocated in equal shares to refiners and non-refiners to bid upon, however, since the refining capacity is captive to these refineries and tolling for other private bidders is solely at a refiner's discretion, the existing helium refiners have effective control over the remaining six percent of helium capacity and an additional market advantage that was surely not envisioned by the 1996 Act. Moreover, any amount of crude helium that remains unsold reverts back to the refiners for purchase—another disincentive for the four companies to provide tolling services.

This current system's drawbacks were noted by the National Research Council's 2010 report, Selling the Nation's Helium Reserve, (the "NRC 2010 Report") which stated: "given that refining the helium must take place at one of the facilities connected to the Helium Pipeline, the limited number of potential processors of federally owned crude helium place significant restrictions on alternatives to the current sale procedures being followed by BLM."[4]

Proof that this system does not promote a competitive market can be seen in the fact that, in the last five years, Air Liquide has been the only non-refiner to purchase any amount of the six percent allocation. The consequences of the situation described above have important implications for end-users of helium. Adopting a more market-based approach was recommended by the NRC 2010 Report which stated the following:

> The Bureau of Land Management (BLM) should adopt policies that open its crude helium sales to a broader array of buyers and make the process for establishing the selling price of crude helium from the Federal Helium Reserve more transparent. Such policies are likely to require that BLM negotiate with the companies owning helium refining facilities connected to the Helium Pipeline the conditions under which unused refining capacity at those facilities will be made available to all buyers of federally owned crude helium, thereby allowing them to process the crude helium they purchase into refined helium for commercial sale.[5]

Utilizing this approach would result in a more accurate and transparent BLM system and would benefit consumers by increasing the number of suppliers competing for the business of federal users and open market users with helium from the BLM. In an analogous situation, the United States has recognized the benefits of opening privately owned interstate pipeline capacity to the market in the natural gas industry where ownership of transportation capacity rights is held separate from ownership of the actual gas pipeline.[6] Noting the impact this system has had on the domestic market, the report states: "[u]nbundling of capacity rights from facility ownership makes it possible for a producer to access markets through a competitive bid for pipeline capacity."[7] Arguably, "[i]f such a regulatory structure were not in place. . .shale gas developments would not have occurred at their recent pace."[8]

We greatly appreciate the efforts of Members of this Committee and Committee staff to meet the goal of increasing access to federal helium in S. 783. In particular, we fully support the conditional tolling provision that requires participants in the federal helium auction to provide tolling services for parties that purchase federal crude helium. By ensuring that tolling services are available to non-refiners, the market for federal helium will be more competitive and provide a better return for the U.S. taxpayer.

C. Allowing an Intervening Year of 100 percent Allocation to Refiners is Antithetical to the Goals of S. 783

While these steps are crucial, we remain concerned that S. 783 would allow the current allocation system to remain in place for another year and that significant portions of the federal helium supply will remain captive to the same four companies for even longer. It is our strong view that actions should be taken immediately to increase access to federal helium and, in turn, increase returns for U.S. taxpayers.

First, if, as currently drafted, the open auction system is not put in place for another year, it is imperative that, in the intervening year, the current allocation sys-

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[4] Selling the Nation's Helium Reserve, National Research Council: Committee on Understanding the Impact of Selling the Helium Reserve, The National Academies Press (2010).

[5] Id. at 8.

[6] Shale Gas and U.S. National Security, Kenneth B. Medlock, et al., James A. Baker III Institute for Public Policy (July 2011).

[7] Id. at 12.

[8] Id.

tem employed by the BLM must be modified to ensure greater access. In our view, the current six percent that is allocated by BLM for non-refiners should be exclusive for non-refiners and immediately raised by a significant enough margin to stimulate participation by a greater number of parties; thereby creating the robust market for taxpayer helium that the bill seeks. Another year of 100 percent allocation to four companies is antithetical to the goals supported in this legislation and would again postpone any benefits that would accrue to U.S. taxpayers and end-users by increasing competition and access.

Second, once the open auction process starts, it is our view that the percentage subject to the auction should be measurably higher than the current 10 percent in the bill. While Air Liquide would not presume to set this percentage, we agree with others in the industry who have advocated for increased access.

Failure to make these changes to the allocation system would obviate much of the bill's goals for increased competition and greater returns for taxpayers. There is simply no reason for Congress to allow four companies to gain one more year of near-total dominance over the market.

II. GLOBAL PRICE IMPACTS AND QUALIFIED BIDDERS

We commend the Committee's efforts to include methodology that can achieve a more accurate minimum price for BLM crude. As the parties work towards achieving the most appropriate return to the U.S. taxpayer, we also ask the Committee to be cognizant of the impact that future changes to the BLM posted crude price will have on the global helium market. As Air Liquide has previously testified, a predictable, repeatable and verifiable BLM crude price will carry lasting, stabilizing effects for not only the domestic but also the global helium community. By maintaining a posted sales price based upon real market data as stipulated in S. 783, a standard market-based index will be maintained in the global marketplace. This index will not be distorted by short-term auction style bids that are unprecedented in the industry and not reflective of the long-term market price at other sources in the U.S. and worldwide.

Air Liquide's goal is to ensure a stable and reliable supply of helium for end-users. Accordingly, as S. 783 opens up access to federal crude helium for more bidders, we also recommend ensuring that only persons with an infrastructure capable of accepting and delivering vast quantities of helium (we have recommended a minimum threshold of 750,000 standard cubic feet delivery increments and prorated 10,000,000 standard cubic feet quarterly lots) be allowed to participate in the auction process. Doing so allows the BLM to manage its sales of federal crude helium effectively and efficiently while ensuring that the broadest base of end-users will be able to rely on a broader base of bidders to service their helium needs.

Air Liquide appreciates the Committee's attention to this important issue and supports the goal of ensuring the continuing viability of the Nation's helium supply. We believe the changes to the current system are achievable without disrupting supply and would do much to add competition to the market and benefit consumers. I thank the Committee for inviting me to testify, and I would be pleased to answer any questions you may have.

STATEMENT OF KEVIN LYNCH, SENIOR VICE PRESIDENT, MATHESON TRI-GAS

Mr. Chairman and Members of the Committee, thank you for allowing Matheson Tri-Gas to share its views on the Helium Stewardship Act of 2013.

Founded in New Jersey in 1927, Matheson Tri-Gas is a global leader in the industrial gases industry.

Today, Matheson is a subsidiary of Tokyo-based Taiyo Nippon Sanso Corporation, which is the fifth largest industrial gases company in the world. Matheson has helium operations within the U.S. in Wyoming, Texas, Nebraska, California, Florida, and Pennsylvania, and we have retail locations in 40 states. We are the sixth-largest supplier of helium within the US, and globally.

Matheson is a "Non-Refiner" of helium—meaning that we do not have a helium purification plant connected to the BLM crude helium pipeline system. Instead, we receive our refined helium through transactions with private parties that that are unconnected to the Federal Helium Reserve or the BLM Pipeline.

Therefore, while we are a significant player in the global helium industry, our interests in the debate over the fate of the helium in the Federal Helium Reserve are slightly different from those of some of the organizations represented at the hearing. Of course, like all industrial gases companies, we are concerned about global helium supply, and as a good corporate citizen we want a fair and efficient helium market worldwide. However, the fortunes of our company are not tied so directly to the continued operation of the Federal Helium Reserve and the Pipeline System.

Matheson supports the core principles embodied in the oral testimony of David Joyner of American Air Liquide, who is presenting the shared views of the three major non-refiners of helium in the U.S. While we are competitors in the industry, Matheson, American Air Liquide and Airgas all agree on the need to extend the operations of the BLM Pipeline and Reserve, to increase access to federal crude helium and to improve the transparency of BLM helium operations.

We are hopeful that the Helium Stewardship Act of 2013 will help us achieve these important goals.

As you know, today the operation of the Federal Helium Reserve and BLM Pipeline System is governed by provisions set out in the Helium Privatization Act of 1996.

The 1996 Act has largely achieved its purpose of selling down the Federal stockpile of crude helium, and it has by and large created conditions of stability and predictability in the helium market. On the negative side, the global helium market has developed considerably since the passage of the 1996 Act. Shortages have pushed crude helium prices up globally, and the BLM's method for pricing its sales of crude helium has become detached from global market conditions. The 1996 Act has resulted in the existence of a cost advantage for the four companies buying crude helium from the Federal Helium Reserve for purification in their refining facilities along the pipeline. This represents a significant cost advantage by these helium Refiners, and a significant disadvantage for their competitors. Worse, it means that the American taxpayer is shortchanged as well.

With the legislative authority in the 1996 Helium Privatization Act about to sunset later this year, Congress has a chance to ensure that sales from the Federal Helium Reserve are conducted in a fair and efficient manner following the passage of new legislation. Since the BLM Pipeline System supports two-thirds of world supply with nearly a third of global helium supply coming directly from the Federal Helium Reserve, the new legislation enacted this year will have a profound effect on the global helium industry for at least the rest of the decade.

As introduced, the Helium Stewardship Act goes a long way towards correcting long-standing inequalities and distortions in the helium marketplace. We support many aspects of the legislation as introduced, and we recommend a number of adjustments and points of clarification in order to improve the bill's workability and results.

AUCTIONS

We agree with the general approach taken in the bill to draw down the helium remaining in the Reserve—an allocated sale to the Refiners at pre-set prices, and an unallocated sale via auction to non-refiners and other potential buyers. The auction provision in particular will dramatically increase access to the Federal crude helium stockpile, and we agree substantially with the structured, gradual approach to the auctions themselves. In the first year, the amount to be auctioned in the unallocated sale would be 10 percent of the total volume available in the Reserve.

While the provisions in the bill to gradually increase the amount to be auctioned in the unallocated sale are helpful, we would suggest an overall cap be placed on the amount to be auctioned. A cap on maximum auction volume as a percentage of total volume in the range of 20 percent to 30 percent would be optimum.

An auction of this amount would provide increased access, aid in price-discovery, and yet maintain a high degree of stability in price and supply volume by ensuring that Refiners have predictable access to the majority of supply. This will aid long-term planning by suppliers and customers alike.

Matheson would not support an auction of an amount greater than 40 percent of the total volume. We believe auctions on that scale would create too much supply uncertainty in the helium market place.

TOLLING

Of course, if the auction provisions in the bill are to have any practical effect, the bill must include unambiguous incentives for tolling by the Refiners at reasonable market rates. It does little good for a non-refiner to acquire federal helium at auction if the Refiners refuse to refine the crude helium through workable tolling arrangements.

Matheson's views on this topic have been shaped from our own unhappy experience with third-party tolling. In 2007, Matheson successfully purchased crude helium from the Federal Helium Reserve. In 2009, we subsequently attempted to purchase tolling services from all of the helium Refiners. We received "NO BID" replies from each. Therefore, the crude helium that we purchased six years ago still sits in the Federal Helium Reserve and on Matheson's Balance Sheet as an unutilized

asset today. Our unsuccessful attempt to secure third-party tolling is what gave rise to our decision in January, 2010 to file a "Petition for Rule Making" with the U.S. Department of Interior.

In order to strengthen the tolling provisions in the bill, we recommend there be an explicit distinction between refining for end customers and refining for Non-Refiner Resellers.

The goal of achieving greater access to the federal crude helium stockpile and increasing competition in the helium market is primarily achieved by increasing access to helium by parties equipped, experienced, and qualified to supply helium to end customers, but who have heretofore been blocked from access to BLM crude helium supply because they do not have helium refining plants connected to the BLM crude helium pipeline. That describes non-refiners of helium, not end users of helium.

We are concerned, however, that Refiners may satisfy their requirements to provide tolling to third-parties by making commercial agreements to "toll" for large end users. Such agreements are likely to include the supply of helium ISO containers, transportation services, and other services that are customarily found in contracts covering sales of helium to end customers. In effect, Refiners will simply be selling pure helium to end users, and their total profits will likely be very similar to the profits they make on traditional sales, as the scope of services supplied will likely be very similar. Refiners will claim to be "tolling" for these end users, when in fact they will be merely selling refined helium to them as they normally would. They would merely designate a portion of that normal transaction as "tolling" in order to satisfy their requirements under this bill.

If such is the case, the price charged to an end user for tolling becomes a fairly meaningless reference price, as tolling may be bundled with other services. Therefore, the provision in the bill requiring tolling at "commercially reasonable rates" is weakened, or perhaps even counter-productive to the goal of increasing access to the federal crude helium reserve by Non-refiners.

Non-refiners who intend to re-sell pure helium must make a profit, and they must provide other services to end customers that also have resulting costs. If the benchmark for "commercially reasonable rates" includes rates that end customers are willing to pay for tolling under a bundled offering of tolling and other services, the benchmark may be set at such a level that Non-refiners are effectively priced out of the market for tolling services.

We therefore recommend that the requirement for tolling be specifically written as an explicit requirement to toll for qualified Non-Refining Resellers of helium who own and maintain adequate facilities and equipment to meet delivery schedules and quality standards for delivery to end-users.

As an alternative to that approach, the bill could empower the Secretary of the Interior to establish explicitly the "reasonable commercial rates" for required tolling services. This could be done by calculating the average cost of refining crude helium by the refining plants connected to the BLM pipeline, and allowing reasonable profit margins for such services provided by the Refiners.

Additionally, each Refiner who tolls for third parties who buy helium from the BLM should be allocated additional pipeline deliveries on a 1:1 volume basis with any tolling services it provides, in order to be "kept whole" on its non-tolling volumes. If not handled properly, there is a possibility that Refiners will be "punished" by having the net volume of crude made available to them for resale to their end customers reduced by the amount they toll. This is a basic fairness provision, to ensure that Refiners that do agree to legitimate tolling for non-refiners will not be disadvantaged.

PRICING

The bill requires that a minimum price for BLM crude helium be established through a survey of Qualifying Domestic Transactions. Significant improvements have been made in this area between the release of the discussion draft on March 22 and the introduction of the bill itself on April 23. In particular, we are pleased that prices for auctions will be established annually, and that the definition of Qualified Domestic Transactions includes transactions that are newly entered into or renegotiated during the prior twelve-month period.

We are also pleased that older helium royalties have been excluded from the survey of qualified transactions. Older agreements that include prices agreed to several years beforehand, with formulaic price adjustments to old prices, will distort the picture of current market price.

We also recommend a clarification by defining "bulk liquid helium" sales as sales of liquid helium in container loads with a nominal capacity of 11,000 gallons or

more, in order to be clear that the price comparison excludes large volume sales of tube trailers, cylinders, or dewars, which carry additional costs, covered by higher prices.

To ensure that the transactions being captured in the survey are all large transactions occurring at similar levels in the supply chain with similar cost and profit structures, we suggest one of two options:

- Increase the threshold for qualifying transactions to 75 mmscf, from 20 mmscf; or
- Add clarifying language to the price determination guidelines to adjust prices occurring at different levels in the supply chain to account for average cost and profit differentials in order to "normalize" such prices back to the original wholesale transactions.

TRANSPARENCY

We also strongly support more transparency in the way information is shared between BLM and industry stakeholders. Information on resale, pricing and storage, for example, is of value to all market participants. It should be made available to all industry participants at the same time it is made available to the helium Refiners. Today, important data is made available to the Refiners well before the rest of the industry, thus giving those companies yet another advantage over their industry competitors.

We applaud the provisions of the bill that call for timely posting by BLM of important industry information online, and we are pleased that the bill directs the BLM to establish regular reporting processes on major issues affecting the Reserve and Pipeline, and that this information be shared with all stakeholders in the helium industry and not just a favored few.

ADDITIONAL POINTS OF COMMENT AND CLARIFICATION

Fees.—Section 5.a. refers to the setting of fees to reflect the economic value of services provided. This is broad language. It will be helpful for market participants to understand what it implies in terms of pricing. Ideally, a standard schedule of prices for such services will be provided in advance of any federal crude helium auctions.

Storage.—Section 5.c. refers to the increasing of storage fees over time to encourage withdrawal of stored helium. Matheson's view is that this provision exists to discourage hoarding of crude helium purchased from the BLM. Accordingly, such increases in storage fees should not apply to any crude helium sourced from private sellers and stored within the BLM system. And, again, we believe that a schedule of such fees and how the increase over time should be published well in advance of any federal crude helium auctions.

Minimum quantities.—We interpret Section 6.e to mean that the Secretary will endeavor to offer for sale each year approximately 2 bscf of crude helium, or whatever is the maximum volume available, given the condition of the federal crude helium storage and delivery system. Given our understanding of approximately 11 bscf in storage as of October 31, 2012 and the target minimum level of 3 bscf, this intention implies that crude helium sales to non-federal users will terminate around October 31, 2016. If that is the case, we recommend that the Secretary be given flexibility to decrease the amount of crude helium offered for sale in order to prolong sales of crude helium to non-federal users.

End-of-life issues.—Some consideration should be given to how to account for and pay for crude helium purchased from the BLM. There is a possibility that as the BLM crude helium stockpile is further depleted, it may reach a point at which although there is nominally 3 bscf or more in storage, the crude helium storage and delivery system will no longer be capable of extracting crude helium and delivering to users who have already purchased it. If that proves to be the case, will the BLM reimburse buyers for "stranded" crude helium in their accounts? Or, should the payment mechanism be changed such that buyers only pay for BLM-supplied crude helium when it is metered through a refining plant, to prevent the problem of having paid for "stranded" helium? While that would not solve the problem of a "surprise" loss of expected volume, it would at least solve the problem of a buyer having paid the federal government money for helium he will never actually take delivery of.

In summary, Matheson believes the Helium Stewardship Act of 2013 provides a very useful framework for conducting the federal government's crude helium program into the future. Some positive changes were made to the bill prior to its introduction last month, and we believe that a handful of other important changes will make it an even stronger legislative product. We would be happy to continue dis-

cussing and exploring various aspects of the bill as it moves through the committee process in the weeks ahead.

APPENDIX B.—JOINT LETTER FROM NON-REFINERS

April 25, 2013.

Hon. DOC HASTINGS,
Chairman, House Natural Resources Committee, 1203 Longworth House Office Building, Washington, DC.

Hon. EDWARD MARKEY,
Ranking Member, House Natural Resources Committee, 2108 Rayburn House Office Building, Washington, DC.

Re: Opposition to the Dent Amendment to H.R. 527, the Responsible Helium Administration and Stewardship Act

DEAR CHAIRMAN HASTINGS AND RANKING MEMBER MARKEY:

We the undersigned—Air Gas, American Air Liquide, and Matheson Trigas ("Non-Refiners")—write to express our concerns about the amendment being offered by Rep. Charlie Dent (R-PA). Collectively, we serve a substantial portion of the end-user market in the U.S. While our companies have differing views on the various provisions of H.R. 527, we are united in our opposition to the Dent amendment. We strongly urge its defeat.

Under current law, three large companies (the helium "Refiners") have almost exclusive access to the helium in the Federal Helium Reserve. Since new legislation is needed in order for the Federal Helium Reserve and pipeline to continue operations, H.R. 527 makes changes that would open up access to the Reserve, thereby increasing market forces and increasing the return to the U.S. taxpayer on the helium sold from the Reserve. The Dent amendment, on the other hand, perpetuates the status quo, giving the three Refiners a continuing distorted market advantage over others in the industry that would not exist in a free market. It undermines the goals we all share—ensuring a stable and reliable helium supply, increasing access to the Federal Helium Reserve, and providing an appropriate return to the U.S. taxpayer on a taxpayer-owned resource.

The Dent amendment is very broadly worded and gives the Refiners far greater protections than currently provided for in their existing contracts with BLM. By strengthening these contracts and perpetuating them for years to come, the Dent amendment essentially renders meaningless H.R. 527 because the contracts—as extended by this language—will largely prevent BLM from delivering product to anyone other than Refiners. Thus, even if a Non-Refiner could purchase crude helium in an auction, the Non-Refiner will not be able to take delivery.

By strengthening and extending these contracts for many years into the future, the Dent amendment leaves in place the same anti-competitive system that the DOI Inspector General determined in 2008 potentially cost taxpayers more than $100 million.

For the same reasons, even expressly limiting the Dent amendment to the 2015 contracts should be rejected. Any delayed implementation of H.R. 527—which already contains a grace period—provides more time to draw down the taxpayer-owned resource by the same three companies who have enjoyed almost exclusive access for nearly 20 years and reduces the return to U.S. taxpayers.

Through the 1996 Helium Privatization Act which governs the operation of the Reserve and pipeline system today, Congress intended the Federal Helium Reserve to end in 2014. Therefore, Refiners had no expectation that contracts would run beyond that date. Moreover, the BLM standard contract states that contract performance is contingent upon acts of Congress. The Dent amendment perpetuates the closed market that has benefitted the Refiners for many years at the expense of the American taxpayer. This is antithetical to the open access and market transparency goals of the bill, as well as the recommendations of numerous studies by the General Accounting Office and the National Academy of Sciences.

For these reasons, we urge the defeat of the Dent amendment.

Sincerely,

AIRGAS,
AMERICAN AIR LIQUIDE,
MATHESON TRIGAS.

STATEMENT OF CRAIG WOOD, PRESIDENT, GASES AND WELDING DISTRIBUTORS ASSOCIATION, INC., DORAL, FL

Mr. Chairman and Members of the Committee:

The Gases and Welding Distributors Association ("GAWDA") is a national trade association representing the interests of some 500 companies that distribute compressed and liquefied gases and related welding equipment, and includes some 300 additional companies that supply products or services to the gases and welding industry. GAWDA distributor members sell a variety of products, including helium, oxygen, argon, nitrogen and carbon dioxide, as well as specialty gases and mixtures, to customers involved in manufacturing, construction, welding, research, health care, and biomedical engineering.

Most GAWDA members are small businesses. Approximately 85 percent of GAWDA distributors have less than $10 million in annual gross revenue, so they have limited leverage in negotiating supply agreements for products. In the vast majority of cases, GAWDA distributors will contract exclusively with a single manufacturer (or in the case of helium, a refiner) for a comprehensive menu of gas products. The contract generally will provide all of the distributor's needs for all of those gases.

In addition, the distributor will generally contract with its customers in an exclusive "requirements" arrangement to supply all of the customer's needs for a variety of gases as well. A small distributor might have a couple of dozen contracts to supply helium and other gases to customers, while a large distributor might have several hundred or more of these requirements contracts.

The GAWDA distributor will typically purchase bulk helium in gaseous form from a refiner; the distributor will then repackage the helium into compressed gas cylinders and deliver them to customers for their use.

GAWDA appreciates the efforts that the committee has made to develop legislation to complete the privatization of the Federal Helium Reserve outside of Amarillo, Texas. We understand the urgency of reauthorizing the sale of helium by the Bureau of Land Management by October of this year to keep the program from expiring, and GAWDA does not want the domestic supply of helium, which amounts to some 50 percent of the U.S. domestic supply and 30 percent of the entire world supply, to go untapped.

GAWDA also understands that the BLM has not obtained market rates of return for the sales of helium to date, and we appreciate that the federal government should earn an appropriate return for the sale of this asset in the marketplace. We agree that any revision to the BLM sales program should include a structure to generate market pricing for crude helium to refiners, and GAWDA does not oppose the provisions in S. 783 to develop a truly market-based pricing mechanism.

GAWDA distributors are concerned, however, about the impact of any legislation on the stability of the existing market for helium, particularly as they affect the ability to meet contractual obligations for product supply. For example, GAWDA members are concerned that a quarterly or periodic auction approach as envisioned in H.R. 527 will interfere with current contracts between refiners and distributors, and between distributors and their end user customers.

By establishing a periodic auction mechanism under which any party may bid, at least for certain tranches of product, the House bill would set up a spot market for helium. Under H.R. 527, if an established refiner is not able to secure all of the crude helium that it requires to meet the supply obligations set out in its contracts, then some distributor customers will receive less than their contractual allotments of helium, or perhaps none at all. The distributor will be forced to seek other sources of supply, presumably only if a force majeure clause in the agreement allows the distributor to obtain replacement product from another supplier.

But the contracts between distributors and gas suppliers are exclusive for all of the gas products together, and it is difficult to predict how a disruption in the ability to supply the required amounts of helium in one quarter will affect the distributor's contractual obligation to purchase, and the manufacturer's contractual obligation to sell, all of the other gases contemplated in the agreement.

Similarly, the distributor unable to obtain all of its requirements for helium in a quarter in turn could end up defaulting on its contracts to supply helium to its customers. The distributor's customers might be forced to seek alternative supplies of helium for at least part of their needs for that period, and to pay above market prices to the winning auction bidder(s) to ensure a continuous supply of product. This also raises questions of the effect on the contractual obligations to sell and purchase the other gases in the contracts.

The same scenario could be replayed each time when the auction is renewed. Refiners, distributors and end users will not know which parties will have adequate

supplies of helium to meet existing contractual demands. This will generate legal questions about contract default, partial product allocations, mitigation of damages, and obligations to cure, as well as commercial questions about which parties may be able to meet supply obligations on a consistent basis. The distributor will have to resolve these issues with each customer for that auction period; when another auction takes place, and different sales volumes of helium are awarded by BLM to new bidders, the distributors will have to go through the same legal and commercial exercise to ensure that each of their customers will receive enough product to meet its requirements.

An unreliable product stream for helium will make it difficult for any distributor to entertain long-term, exclusive supply arrangements with customers that foster stable commercial relations and support economic growth.

In contrast to the House approach, S. 783 would establish a gradual transition to an auction mechanism. The current allocation system between the BLM and refiners would remain in place until October 1, 2014, and the following year ten percent of the available crude helium sold from the reserve would be held at auction. Each year an additional tem percent of the available crude product would be added to the auction. GAWDA believes this gradual transition to an broader auction is a better approach; it will allow refiners, distributors and end users greater certainty about supply in the near term, while developing a more market-based mechanism in the longer term.

GAWDA fears that an unstable auction mechanism affecting upwards half of the domestic U.S. helium supply could create havoc not merely for refiners and distributors, but also for the industries that rely heavily on helium as a component of their operations. Health care providers, manufacturers of semiconductors and other high tech products, metal fabricators, universities and other research facilities, and even party balloon suppliers, will no longer have a consistent and stable source of helium from their distributors.

As this legislation moves forward, and particularly in conference, GAWDA asks that the committee consider its potential disruptive effect on the markets for both crude and refined helium and the end users that rely on this product. We support the committee's efforts to pass legislation this year to continue the sale of the Federal Helium Reserve, and at fair market prices, and we favor the gradual transition to an auction approach as outlined in S. 783 to encourage a sufficiently reliable supply of helium for the U.S. economy.

STATEMENT OF SCOTT KALTRIDER, VICE PRESIDENT, BUSINESS MANAGEMENT & HELIUM PRAXAIR, INC.

Praxair appreciates the opportunity to add to the discussion regarding the Helium Stewardship Act of 2013 (HSA). The HSA is necessary legislation to prevent a profound disruption in the global helium market, which will severely impact consumers, scientists, and employers. Praxair applauds the work of Chairman Ron Wyden (D-WA) and Ranking Member Lisa Murkowski (R-AK) to introduce this important piece of legislation.

Praxair, Inc., is the largest industrial gas company in North and South America and one of the largest worldwide. Praxair is headquartered in Danbury, CT and employs approximately 10,000 people in more than 500 facilities across the United States. The company manufactures, sells, and distributes atmospheric, process, and specialty gases. Praxair products, services, and technologies bring productivity and environmental benefits to a wide range of industries including aerospace, chemicals, food and beverage, electronics, healthcare, manufacturing, and metals among others. We have operations, employees, or customers in nearly every state represented on this Committee.

Praxair has been in the helium business for nearly 100 years serving both private and federal government users. We supplied the helium used by NASA to launch space shuttles into orbit, the helium-oxygen breathing mixtures used by Navy sailors while performing deep-dive operations, and the helium used by the Air Force each time a Delta 4-Heavy is launched to provide our intelligence community with the information necessary to protect our citizens.

Our long-term planning coupled with investments in a robust supply chain and a diverse set of crude and refined helium sources have made us a world leader in refined helium production and distribution. We have about $500 million invested in plants and equipment required to access, process, refine, and deliver to market helium sourced from the Federal Reserve operated by the Bureau of Land Management (BLM).

Praxair's written comments identify the positive aspects of the legislation as well as areas where we believe modifications should be considered.

I. OVERALL THE HSA IMPLEMENTS A THOUGHTFUL APPROACH TO RE-AUTHORIZATION OF THE FEDERAL HELIUM PROGRAM

There is unanimous agreement that the Federal Helium Program must be re-authorized. There is also a consensus that the re-authorization must satisfy two important goals: (1) obtain fair market value for federally sourced crude helium and (2) do so in a transparent mechanism that will avoid disrupting the helium supply chain.

Meeting these two objectives, however, is more difficult than it would seem at first impression and Praxair commends Chairman Wyden and Ranking Member Murkowski for crafting a proposal that will provide continued access to the Federal Reserve while industry continues to develop new helium supplies. As discussed in greater detail below, the HSA protects the stability of the helium supply chain, avoids entanglements with existing contracts, and respects private property rights.

A. The HSA's Phased-In Auction Promotes Market Stability

The HSA creates a new phased-in crude helium auction while preserving aspects of the current allocation system. This is a wise approach. We are concerned that a more aggressive initial auction will cause substantial disruption in the global helium supply chain. For example, HR 527, which was recently passed in the House of Representatives, contains an immediate 100-percent semi-annual auction. We believe that such an auction replaces the current predictability in supply with significant uncertainty. Under a 100-percent semi-annual auction, no supplier of refined helium would know the quantity of helium they would have from one six-month period to the next. As a result, it would be impossible for suppliers, including Praxair and others, to enter the long-term supply contracts our customers current have and demand. Without long-term supply contracts, end-users would be subjected to a perpetual spot market.

In recognizing the potential of this serious problem, the HSA avoids this type of supply-chain disruption through its phased-in auction. By preserving non-auctioned allotments of crude helium, U.S. end-users who are supplied by the three leading suppliers of helium that built refineries connected to the Federal Helium Reserve will have the confidence in their supply necessary to continue to operate reliably and competitively on a global basis. This framework successfully satisfies one of the two goals mentioned above.

B. The HSA's Pricing Structure Promotes Price Stability and Provides Fair Return to the U.S. Taxpayer

In recognizing the importance of obtaining fair market value for federally sourced crude helium, the HSA uses the result of the phased-in auction as one data point to price the remaining allocated crude helium. A variety of other data points are also used in order to determine the best price, including data collected from "qualifying domestic helium transactions" that will be treated as confidential by the Secretary.

This approach provides a safeguard in the event an auction fails to generate interest or robust bidding. We believe that it is possible that a large auction or the 100-percent auction, as contemplated in the HR 527, may not have the positive result many expect. While it is true that current demand is outpacing supply, new supplies will be coming on line in the near-term. For example, a project is currently underway in Qatar, which, when completed, will be the largest helium production facility in the world. Parties purchasing from Qatar will be doing so under "take-or-pay" contracts and will be contractually required to purchase from this source before going to another source, including the Federal Helium Reserve. This development may reduce demand for federally-sourced crude helium resulting in a less robust auction and, therefore, may actually reduce revenues.

C. The HSA Recognizes the Importance of Respecting Existing Contracts Between the Federal Government and Private Companies

Various privately negotiated contracts exist between private entities, such as Praxair, and the U.S. government that extend beyond 2014. These contracts include agreements to store crude helium in the reserve, to use federally-owned pipelines, and to lease a privately owned helium enrichment unit. Unilaterally terminating these agreements by enacting conflicting legislation would raise serious legal issues.

The HSA's "Existing Agreements" provision recognizes this important reality and we strongly ask the Committee to resist any suggestion to remove it. Praxair has made significant investments and business plans based on our expectations that are

guaranteed in these contracts. We take great pride in honoring our agreements, and expect the U.S. Government to do the same.

D. The Committee Should Resist Any Effort to Create a Stronger "Tolling" Mandate

The HSA includes a provision which makes "as a condition of sale or auction to a refiner . . . the refiner must make excess refining capacity of helium available at commercially reasonable rates" to those prevailing at auction that do not have similar refining capability.

While we do not support this provision and continue to question its legality, we strongly encourage this Committee to reject arguments to change this provision to mandate that refiners, such as Praxair, reserve "sufficient refining capacity" to others who do not have such capacity.

Praxair along with the other refiners took financial risk to invest in building refining capacity connected to the reserve that has, in turn, created a successful public-private partnership to transform federally-sourced crude helium into product usable by our nation's leading manufacturers and researchers. In addition, the Praxair refineries that purify federally-sourced crude also receive helium from multiple other private sources. As a result, our "excess refining" capacity is influenced by the volume of helium that is produced by these private sources that we are contractually obligated to purchase. Serious legal issues would arise in the event that a "tolling mandate" were to interfere with our ability to accept privately-sourced helium.

II. THE HSA CAN BE IMPROVED BY REVISITING PROVISIONS CONTAINED IN THE EARLIER DISCUSSION DRAFT

Two important provisions that were contained in the Discussion Draft were modified in the HSA, as introduced. We respectfully request the Committee to review the following comments and revisit these provisions.

A. The Discussion Draft's "Existing Storage" Provision

The crude helium currently stored at the Federal Helium Reserve consists of both Federally-owned helium as well as helium owned by private refiners that has not yet been delivered. Any reform to the Federal Helium Program must take into account this reality and ensure that these owners have timely access to their property.

Section 5(e) of the HSA Discussion Draft recognized this important issue and included the following provision:

> (e) EXISTING STORAGE.—Any helium in storage as of the date of enactment of the Helium Stewardship Act of 2013 shall receive priority pipeline access, except that the helium shall not have priority over helium intended for Federal users.

This provision was unfortunately not included in the HSA, as introduced.

A recent legal analysis of HR 527, the Responsible Helium Administration and Stewardship Act of 2013 prepared by Cooper & Kirk, PLLC concluded that any delay in owners' ability to access their helium stored in the Federal Helium Reserve would implicate the Takings Clause of the Fifth Amendment of the U.S. Constitution, and stated in relevant part:

> The proposed statute has the potential of effectuating a taking by denying the refiners access, for an indefinite period of time, to the helium they store in the Reserve. Refiners have stored helium in the government's reservoir since the 1980s. Natural gas extractors and helium refiners enter into contracts under which the helium refiners are entitled to the helium released during the natural gas extraction process. The refiners are obligated to pay for this helium, even if they cannot use it immediately. The refiners' only options are to refine and sell the helium, store it, or vent it. Rather than wasting any excess helium, the refiners store it in the Reserve. This helium is the refiners' property, and the government is merely storing it. Praxair, for example, still holds legal title to the helium it stores, continues to pay property taxes on the appraised value of the stored helium, and has a contractual right to have BLM redeliver its helium.
>
> To the extent that [the HSA] makes it impossible for the pipeline to be used for any purpose other than for [new] helium sold . . . it is possible that the United States might temporarily confiscate the refiners' property without just compensation. As of the end 2012, Praxair had millions of dollars of helium stored in the Reserve. Congress should ensure that helium stored in the Reserve is accessible to its rightful owners.

Considering the foregoing, the "Existing Storage" provision contained in the HSA Discussion Draft should be re-inserted so that constitutional property rights are respected and the Federal government is not exposed to significant liability.

B. The Discussion Draft's "Safety Valve" Provision

The HSA Discussion Draft contained a "Safety Valve" provision that gave the Secretary the discretion to decrease the annual auction percentage, but instructed the Secretary to notify Congress in the event he wished to increase the auction percentage. The HSA, as introduced, however, flipped these requirements. Under the current version, the Secretary has open discretion to increase the auction percentage, but must notify Congress in the event that he wishes to decrease the percentage.

This asymmetrical approach seems to send a clear message to the Secretary that he should think twice before decreasing the auction percentage, but that he is free to raise the percentage as he sees fit. This approach communicates a convoluted message to the Secretary. In our perspective, the Secretary should have the same discretion to either increase or decrease the auction percentage.

III. THE HSA SHOULD DEFINE "QUALIFIED BIDDER" TO AVOID STRANDING HELIUM

In order to participate in the HSA's proposed annual auction, a party must be certified as a "qualified bidder." This term is defined as "a person the Secretary determines is seeking to purchase helium for their own use, refining, or redelivery to users." While this definition is sufficiently narrow to exclude speculators and alike, it remains broad enough to cover entities that may wish to bid for helium, but lack the necessary capabilities to take possession of the product once it has been refined. For example, specially engineered cryogenic containers as well as a trucking fleet are required to move helium from one of the refineries to its next destination—either a site for consumption or a location where that bulk product will be divided into yet smaller cylinders. Industrial gas companies, such as Praxair, have made these essential and capital intensive investments to ensure that its customers' helium needs are timely met. Without this capability, a winning bidder's helium may remain stranded, which could negatively impact the helium supply chain depending on the volume stranded.

While we disagree with many of the conclusions and recommendations contained in the "non-refiners" respective written statements, we agree that additional limiting language should be inserted into HSA's definition of "qualified bidder" to avoid stranded helium or, at the least, significant delays while a winning bidder arranges logistics. Such language could include limiting the auction to those who are seeking helium for refining and/or redelivery.

IV. PRIVATE HELIUM DEVELOPMENT AND SOURCING POST CLOSURE OF THE FEDERAL HELIUM RESERVE

The current helium supply-demand imbalance will improve in the coming months and, moreover, the global industrial gas industry is well positioned to meet refined helium demands once private helium sales from the Federal Reserve end. Private helium development is not about pricing, it is about timing. Private and foreign government development of helium sources is timed to coincide with the closure of the Federal Reserve.

The global industrial gas industry has made substantial investments in expanding global helium capacity with substantial additional increases in global capacity scheduled to come on line in the second half of the year. Since the 1990s when the 1996 Helium Privatization Act was enacted, an additional 50% of global helium supplies have been brought online, largely from projects in the United States, North Africa, and the Middle East. The recent supply-demand imbalance has resulted because demand has outpaced industry's ability to bring new projects online while existing sources have experienced unexpected supply disruptions.

Nevertheless, there are new helium projects, in the United States and abroad, that are scheduled to come online or are currently being developed. About 30% of the current global helium supply will be starting up in the next 6-12 months. Praxair has and will continue to invest tens of millions of dollars in the United States to develop additional helium supply, including securing lease rights to develop new sources. In addition, L'Air Liquide S.A., a French multinational company, has rights to about 50% of the new sources coming online that have been developed by foreign governments.

V. CONCLUSION

We thank the Committee for considering our views. The HSA is a good starting point for discussion and we are confident that with the types of modifications outlined above we will have a product that can be supported by all stakeholders.

STATEMENT OF SHANE SCHULZ, DIRECTOR OF GOVERNMENT AFFAIRS, QEP RESOURCES, INC.

Chairman Wyden, Senator Murkowski and members of the Committee, thank you for the opportunity to provide written testimony on S. 783, Helium Stewardship Act of 2013. My name is Shane Schulz and I am the Director of Government Affairs for QEP Resources, Inc ("QEP"). QEP is a leading independent natural gas and crude oil exploration and production company headquartered in Denver, Colorado. We have oil and gas operations in the Rockies which include large acreage positions on federal lands. QEP also gathers, compresses, treats, and processes natural gas.

I manage legislative and regulatory policy matters for QEP, including tracking S. 783, the helium legislation you are working on in your committee. I appreciate the amount of time and hard work you have put into this legislation. Helium is a vital resource for America's high tech manufacturers including its use in MRI machines and semiconductors. It is also a resource for certain welding practices and is of strategic importance for the Department of Defense and the space program.

At QEP, we welcome the language in S. 783 that helps ensure more price transparency. This includes ensuring the BLM does not sell helium below market value and artificially depresses helium prices. Those practices can discourage producers from developing new supplies of helium. However, Congress can and must do more to ensure and encourage the development of future supplies of helium.

Helium end-users are very concerned about the continued sufficient supply of helium, not only in the short-term but also in the long-term. We can appreciate their concern. A constant alarm by many of the end-users is what will happen to helium markets when the Federal Helium Reserve winds down and where will the future long-term supply be sourced. We applaud the work of the authors of this legislation, but we believe this bill could do more to promote long-term production of helium from the U.S. helium resource base.

Rather than importing helium from abroad, potentially from hostile governments, we should look to develop our helium reserves here in the U.S. The U.S. does have significant helium reserves, much of it is within the federal mineral estate. As referenced by several witnesses at the May 7th hearing, Wyoming has substantial helium reserves. Other areas in the West that may contain potential helium reserves include the Four Corners area and certain locations in Utah. These areas include large amounts of federal mineral and surface estate which in most cases is managed by the BLM.

Congress can and should do more to provide regulatory certainty for natural gas producers that want to invest new capital and bring new helium resources online. Operating on federal lands creates unique issues for everyone, but especially for those targeting helium extraction and production. Like all drilling operations these activities are subject to the National Environmental Policy Act (NEPA) prior to approval for exploration and production activities on federal lands. NEPA invites public comment and participation that is important, but the process as administered by BLM currently creates additional reviews which can often be very lengthy and costly. Such NEPA requirements routinely lead to delays which, depending on the complexity of the project, can be several years.

A company and its investors need to know federal agencies will permit helium projects in a timely manner and have the staffing resources to do so. We encourage you to include language which would help send positive signals to the agencies as well as the companies that are looking at producing helium. Such signals should suggest helium projects will be recognized as a priority when it comes to development on public lands. Congress can draw upon a number of precedents under current law to ensure timely permitting of helium projects without limiting or forgoing the necessary environmental reviews. We are not suggesting you do anything to weaken NEPA reviews, but we are suggesting you provide for the dedication and prioritization of resources to insure helium related projects are brought online in a timely fashion.

We recognize the focus of this bill is to deal with the responsible draw-down of the Federal Helium Reserve but we believe this is a perfect opportunity to help send signals to the private sector to help bring more helium supply online. We encourage you to look for opportunities to help promote production of helium where you can, and one of those areas is on federal lands.

It is important to note increased helium production on federal lands would do more than address the helium shortage. Helium production from federal lands also creates additional revenue to the federal government because helium producers pay the federal government the equivalent of a royalty to produce and sell helium from federal lands. That is an extra benefit along with increased supply that should not be ignored. Helium production from federal lands can grow with the right prices signals and a smart regulatory structure in place. Often times helium is part of a gas steam that needs processed and treated which adds to the complexity and capital intensive nature of helium related projects. Regulatory certainty helps remove some of the risk involved in developing some of these projects. Natural gas producers, like QEP, stand ready and willing to help develop our helium reserves.

Thank you for the opportunity to provide written testimony on S. 783. We encourage you to take this opportunity to also help promote long-term supplies of helium while working on the reauthorization of the Helium Reserve. I, along with others at QEP, welcome further questions and discussion about helium production and the federal government's role in helping meet future helium needs.

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