Statement of Considerations

REQUEST BY ADVANCED MICRO DEVICES, INC. (AMD) FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN RIGHTS IN SUBJECT INVENTIONS MADE IN THE COURSE OF OR UNDER RFQ 2028206 UNDER PRIME CONTRACT NO. DE-NA0003525; DOE WAIVER DOCKET W(A)2022-007

Advanced Micro Devices, Inc. (AMD) has requested an advance waiver of patent rights of the United States of America to any invention(s) that may be made in the performance of the work under RFQ 2028206 under SNL Prime Contract DE-NA0003525 entitled "Advanced Memory Technology." AMD will work in collaboration with Sandia National Laboratory (SNL) to explore two technologies with the potential to support the goal of 40x improvement in effective performance of NNSA applications over the initial exascale computer systems, Frontier and El Capitan. The project will advance the readiness of the technologies for post exascale High Performance Computing (HPC) system in 2025 and beyond.

The objective of the project is to enhance stacked Dynamic Random Access Memory (DRAM) [redacted] that could significantly improve bandwidth [redacted], latency, and power efficiency compared to a standard High Bandwidth Memory (HBM) "glide-path" approach. The [redacted] processor chip's memory interface and data fabric will be optimized for this high bandwidth memory. Near-memory data manipulation and data marshaling functions may also be explored. [redacted]

AMD will collaborate [redacted] to explore the integration of novel memory technologies into future systems. Because of AMD's central position between memory companies and system integrators, its excellent track record of collaboration and co-design with the Department of Energy (DOE) national labs, active leadership in Joint Electron Device Engineering Council (JEDEC) and other standards organizations, AMD is uniquely positioned to commercialize the integration of advanced memory technologies for future NNSA deployments. The proposed work will also benefit from AMD's close collaboration with NNSA Labs on hardware, software tools, and applications for El Capitan.

The total cost of the proposed work is $11.71M over 36 months. The US government cost is 60% and the AMD's cost share is 40%. Total cost to the government is $7.026M. AMD's (and potential subcontractors') cost is $4.684M. The parties are targeting to start work in October, 2022, pending contract execution. AMD (and potential subcontractors) are investing 40% of the cost to perform the work, listed in item 3 of waiver petition. AMD has invested substantially over the years in technologies that interoperate with memory technologies. AMD invested over $2.8 billion in research and development in 2021, as stated in public financial filings: https://ir.amd.com/secfilings/content/0000002488-22-000016/0000002488-22-000016.pdf

AMD seeks to own and retain:
(a) the entire copyright, and equivalent rights, throughout the world in any work, including data, that may be created in the performance of the above contract; and
(b) the entire right, title, and interest throughout the world to each invention that may be conceived or reduced to practice in the performance of the contract, and the entire right, title, and interest in any patent rights issuing from such inventions, subject to the Government license, march-in rights, and preference for U.S. Industry noted above;

with no restriction to field of use, to each Subject Invention(s) under the provisions of an agreed upon IP waiver clause 10 CFR §784.12 PATENT RIGHTS--WAIVER (JUL 1996) (with Section (k) (Background Patents) deleted and reserved) and 35 U.S.C. §203.

In addition, AMD seeks modifications to the Data Rights provision FAR §52.5227-14 of the subcontract. AMD seeks to have advance rights in technical data developed under the subcontract. AMD wants the Class Advance Waiver to enable AMD to assert copyright in computer software without the Contracting Officer's prior approval. Under the subject Advanced Memory Technologies Program, AMD wants DOE to agree, in advance, to authorize AMD to assert copyright, without the Contracting Officer's prior approval, in software produced under the subcontract by its employees, subject to a limited government-use license to allow AMD sufficient time to commercialize the computer software. AMD wants to protect data generated under the subcontract from public release.

Similar waiver authorizations were approved in the past for the following clause in the Appendix. It was suggested that an authorization of the waiver petition for software rights and data protection be granted for a limited time of up to five years.

Referring to items 5-9 of waiver petition, AMD's experience and expertise will contribute substantially to the development of the invention made under the program. AMD is a global semiconductor design company established in 1969 and headquartered in Santa Clara, California. AMD's graphics and computing processing technologies power a variety of leading computing solutions, including HPC systems, as well as servers, workstations, personal computers, and embedded systems for the global commercial and public sector markets. AMD's annual revenue for 2021 was approximately $16.4 billion. AMD currently has a 22.9% market share of overall server market revenue.

AMD is a world-leading supplier of computer processors for high-performance computing, including the first exascale supercomputer, DOE's Frontier. AMD also supplies processors for the next generation exascale supercomputer, El Capitan. AMD holds patents across a range of technologies related to production of central processing units (CPUs), graphics processing units (GPUs) and domain-specific accelerators. Moreover, AMD holds patents on systems on chip (SoC) and interconnections between SoCs and memory modules, which pertain to the work proposed in the program. The inventions to be generated under the program will fit within complex information technology systems and may apply to specific microarchitectures that AMD provides. As the source of the inventions, AMD is the best party to successfully commercialize such technology. These advances will help improve the US economy and US industrial competitiveness.

If the research in the program finds commercially compelling performance gains, AMD will invest substantially to bring the technologies into future products. While the proposed work will explore design alternatives, the ultimate commercialization will require lower level design work, testing and validation of the components to produce parts. Such engineering requires substantial investment of resources and existing technical infrastructure at AMD. If the work performed in the contract leads to commercialization, AMD would work with partners to design products that incorporate any Subject Inventions. Owning the inventions will provide AMD clarity on patent rights when creating differentiated products with commercial viability.

The granting of the waiver will assist AMD in maintaining and extending a technology leadership position among foreign competitors and potentially play a significant role in ensuring U.S. competitiveness in the manufacture of technologies for next generation high performance computing systems. The research done under this contract will allow for technologies that have promising commercial value to also address the often-unique requirements of critical government systems. The

benefit of this is in ultimately producing memory and storage technologies in volume that benefit both commercial and critical government applications, thus reducing the cost to the government.

Referring to item 10 of the waiver petition, AMD does not believe the waiver would place them in a dominant position due to competing technologies being developed by different companies.
The proposed work is early-stage research during which the commercial success is uncertain. The Subject Inventions will not reduce competitors' ability to independently investigate their own memory technologies. Interfaces to memory technologies are defined within an industry-wide standards committee, JEDEC.org, of which AMD is a member. Subject inventions from the research program would not impede competitors from interfacing with other memory technologies through JEDEC specifications.

AMD has had prior research programs with the U.S. Government that include memory integration called "PathForward" Subcontract number B62717.

Referring to item 13, the work under the contract is not directly related to public health, safety or welfare. However, if the technologies are commercialized, they may be used by companies, institutions or government agencies who engage in health, safety and welfare. The technologies may be used to enable computer simulations of physical phenomena (molecular interaction, physical properties, epidemic spreading, etc.) that project potential health, safety and welfare options that professionals in those fields find useful.

A request for US manufacture waiver is being processed separately.

Considering the foregoing, it is believed that awarding this waiver will provide AMD with the necessary incentive to invest their resources in commercializing the results of the award in a manner that will make the above technology available to the public in the shortest time. Therefore, upon evaluation of the waiver petition and in view of the objectives and considerations set forth in 10 CFR 784, all of which have been considered, it is recommended that the requested waiver be granted.

[redacted]

Carmen Ekstrom
NNSA Patent Attorney

Date: 10-25-22

Based on the foregoing Statement of Considerations and the representations of the attached Waiver Petition, it is determined that the interests of the United States and the general public will best be served by a waiver of patent rights of the scope described above and, therefore, the waiver is granted.

CONCURRENCE:

[redacted]

Simon D. Hammond, PhD.
Federal Program Manager
Office of Advanced Simulation and Computing &
Institutional Research and Development Programs
(NA-114)
National Nuclear Security Administration
US Department of Energy

Date: 2022-OCT-26

APPROVAL:

[redacted]

Brian Lally
Assistant General Counsel
For Technology Transfer and
Intellectual Property (GC-62)

Date: _____

Appendix

FAR 52.227-14 Rights in Data-General (Dec 2007) (modified as follows)

(c) Copyright.

(1) Data first produced in the performance of this contract.

(i) Unless provided otherwise in paragraph (d) of this clause, the Contractor may establish, without prior approval of the Contracting Officer, claim to copyright subsisting in scientific and technical articles based on or containing data (Published Data) first produced in the performance of this contract and published in academic, technical or professional journals, symposia proceedings or similar works. For the published data, the Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, nontransferable, irrevocable, paid-up worldwide license to practice or in such copyrighted Published Data to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.

(ii) When authorized to assert copyright to the data, the Contractor shall affix the applicable copyright notices of 17 U.S.C. 401 or 402, and an acknowledgment of Government sponsorship (including contract number).

(iii) The Contractor may establish, without prior approval of the Contracting Officer, claim to copyright subsisting in Computer Software first produced in the performance of this contract. For Computer Software, the Contractor grants to the Government and others acting in its behalf during the period of Contractor's commercialization of the software, a paid-up nonexclusive, irrevocable worldwide license in such copyrighted Computer Software to reproduce, prepare derivative works, and perform publicly and display publicly by or on behalf of the Government. The Contractor will provide an Announcement Notice, AN 241.4 Software Announcement Notice, along with providing the source code, the executable object code and the minimum support documentation needed by a competent user to understand and use the Computer Software to DOE's Energy Science and Technology Software Center (ESTSC) via www.osti.gov/estsc.

(iv) The Contractor may establish, without prior approval of the Contracting Officer, claim to copyright subsisting in all Other Data, which is data first produced in the performance of this contact that is neither Computer Software nor Published Data. For such Other Data, the Contractor grants to the Government and others acting in its behalf, a paid-up nonexclusive, irrevocable worldwide license in such copyrighted non-published data to reproduce, prepare derivative works, and perform publicly and display publicly by or on behalf of the Government.

(v) After the time period set forth below in (d)(3) for Other Data or when he Contractor abandons commercialization of Computer Software, or if, prior to the end of such periods, the contractor has not taken effective steps to commercialize the software, or where it is necessary to alleviate health, safety or energy needs that are not reasonably satisfied by the Contractor, or to meet requirements for public use specified by Federal Regulations and these requirements are not reasonably satisfied by the Contractor, the Contractor grants to the Government, and others acting on its behalf, a paid-up, nonexclusive, irrevocable worldwide license in such copyrighted software to reproduce, distribute copies to the public, prepare derivative works, perform publicly and display publicly, and to permit others to do so.

(2) Data not first produced in the performance of this contract. The Contractor shall not, without prior written permission of the Contracting Officer, incorporate in data delivered under this contract any data not first produced in the performance of this contract unless the Contractor—

(i) identifies such data; and

(ii) grants to the Government, or acquires on its behalf, a license of the same scope as set forth in subparagraph (c)(1) of this clause, or if such data are restricted computer software, the Government shall acquire a copyright license as set forth in paragraph (g)(4) of this clause (if included in this contract) or as otherwise provided in a collateral agreement incorporated in or made part of this contract.

(3) Removal of copyright notices. The Government will not remove any authorized copyright notices placed on data pursuant to this paragraph (c), and will include such notices on all reproductions of the data.

(d) Release, publication and use of data.

(1) The Contractor shall have the right to use, release to others, reproduce, distribute, or publish any data first produced or specifically used by the Contractor in the performance of this contract, except—

(i) As prohibited by Federal law or regulation (e.g., export control or national security laws or regulations);

(ii) As expressly set forth in this contract; or

(iii) If the Contractor receives or is given access to data necessary for the performance of this contract that contain restrictive markings, the Contractor shall treat the data in accordance with such markings unless specifically authorized otherwise in writing by the Contracting Officer.

(2) The Contractor shall promptly deliver to the Contracting Officer or to the DOE Patent Counsel designated by the Contracting Officer a duly executed and approved instrument fully confirmatory of all rights to which the Government is entitled, and other terms pertaining to the Computer Software to which claim to copyright is made.

(3) For Other Data that is copyrighted in subparagraph (c)(1)(iv) above, the Government will have practiced for or on behalf of the United States the subject invention throughout the world the right to provide to third parties such Other Data delivered to the Government in performance of this contract after five years from the date that such data is first produced. The Government shall have the right to provide Other Data to third parties sooner provided that such data (1) are generally known or available from other sources without obligation concerning its confidentiality, (2) have been made available by the owner to others without obligation concerning its confidentiality, or (3) are otherwise already available to the Government without obligation concerning its confidentiality. Interim disclosure or use also may be made for the following purposes:

(i) As required for evaluation by Advanced Memory Technology Program personnel at DOE/NNSA and DOE/NNSA Laboratories;

(ii) As required to support the Accelerated Simulation Computing (ASC) Program objectives;

(iii) As required to respond to a request under the Freedom of Information Act (5 U.S.C. 552), and other applicable laws or regulations, if any;

(iv) As required to meet the Government's obligations under international agreements and treaties;

(v) As required to commercialize the data if the Contractor has not taken effective steps to do so;

(vi) As required to alleviate health, safety or energy needs that are not reasonably satisfied by the Contractor; and

(vii) As required to meet requirements for public use specified by Federal Regulations and these requirements are not reasonably satisfied by the Contractor.