

EXHIBIT 1D - PATENT RIGHTS - WAIVER (11-00)

(a) Definitions. As used in this clause: (1) "Background data" means data which is owned or controlled by the Seller at any time through the completion of this subcontract: (i) Which the Seller, but not the Government, has the right to license to others without obligation to pay royalties thereon, and, (ii) Infringement of which cannot reasonably be avoided upon the practice of any specific process, method, machine, manufacture, or composition of matter (including relatively minor modifications thereof) which is a subject of the research, development, or demonstration work performed under this subcontract.

(2) "Background patent" means a domestic patent covering an invention or discovery which is not a Subject Invention and which is owned or controlled by the Seller at any time through the completion of this subcontract: (i) Which the Seller, but not the Government, has the right to license to others without obligation to pay royalties thereon, and (ii) Infringement of which cannot reasonably be avoided upon the practice of any specific process, method, machine, manufacture or composition of matter (including relatively minor modifications thereof) which is a subject of the research, development, or demonstration work performed under this subcontract.

(3) "Subcontract" means any subcontract, grant, agreement, understanding, or other arrangement, which includes research, development, or demonstration work, and includes any assignment or substitution of parties.

(4) "DOE patent waiver regulations" means the Department of Energy (DOE) patent waiver regulations at 10 CFR Part 784.

(5) "Invention", as used in this clause, means any invention or discovery which is or may be patentable or otherwise protectable under Title 35 of the United States code or any novel variety of plant that is or may be protectable under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.).

(6) "Made", when used in relation to any invention means the conception or first actual reduction to practice of such invention.

(7) "Nonprofit organization" means a university or other institution of higher education or an organization of the type described in section 501(c)(3) of the Internal Revenue code of 1954 (26 U.S.C. 501(c)) and exempt from taxation under section 501(a) of the Internal Revenue Code (26 U.S.C. 501(a)) or any nonprofit scientific or educational organization qualified under a state nonprofit organization statute.

(8) "Patent Counsel" means the Department of Energy Patent Counsel assisting the procuring activity.

(9) "Practical application" means to manufacture in the case of a composition or product, to practice in the case of a process or method, or to operate in the case of a machine or system; and, in each case, under such conditions as to establish that the invention is being utilized and that its benefits are, to the extent permitted by law or Government regulations, available to the public on reasonable terms.

(10) "Secretary" means the Secretary of Energy

(11) "Small business firm" means a small business concern as defined at Section 2 of the Pub L. 85-536 (15 U.S.C. 632) and implementing regulations of the Administrator of the Small Business Administration for the purpose of this clause, the size standards for small business concerns involved in Government procurement and subcontracting at 13 CFR 121.3-8 and 13 CFR 121.3-12, respectively, will be used.

(12) "Subject invention" means any invention of the Seller conceived or first actually reduced to practice in the course of or under this subcontract, provided that in the case of a variety of plant, the date of determination (as defined in section of 41(d) of the Plant Variety Protection Act (7 U.S.C. 2401(d)) must also occur during the period of subcontract performance.

(b) Allocation of Principal Rights. Whereas DOE has granted a waiver of rights to subject inventions to the Seller, the Seller may elect to retain the entire right, title, and interest throughout the world to each subject invention subject to the provisions of this clause and 35 U.S.C. 202 and 203. With respect to any subject invention in which the Seller elects to retain title, the Federal Government shall have a nonexclusive, nontransferable, irrevocable, paid-up license to practice or have practiced for or on behalf of the United States the subject invention throughout the world.

(c) Invention disclosure, election of title, and filing of patent applications by Seller. (1) The Seller shall disclose each subject invention to the Patent Counsel within six months after conception or first actual reduction to practice, whichever occurs first in the course of or under this subcontract, but in any event, prior to any sale, public use, or public disclosure of such invention known to the Seller. The disclosure to the Patent Counsel shall be in the form of a written report and shall identify the inventors and the subcontract under which the invention was made. It shall be sufficiently complete in technical detail to convey a clear understanding, to the extent known at the time of the disclosure, of the nature, purpose, operation, and physical, chemical, biological, or electrical characteristics of the invention. The disclosure shall also identify any publication, on sale, or public use of the invention and whether a manuscript describing the invention has been submitted for publication and, if so, whether it has been accepted for publication at the time of disclosure. In addition, after disclosure to the Patent Counsel, the Seller shall promptly notify the Patent Counsel of the acceptance of any manuscript describing the invention for publication or of any on sale or public use planned by the Seller.

(2) The Seller shall elect in writing whether or not to retain title to any such invention by notifying the Patent counsel at the time of disclosure or within 8 months of disclosure, as to those countries (including the United States) in which the Seller will retain title; provided, that in any case where publication, on sale, or public use has initiated the 1-year statutory period wherein valid patent protection can still be obtained in the United States, the period of election of title may be shortened by the Agency to a date that is no more than 60 days prior to the end of the statutory period. The seller shall notify the Patent counsel as to those countries (including the United States) in which the Seller will retain title not later than 60 days prior to the end of the statutory period.

(3) The Seller shall file its United States patent application on an elected invention within 1 year after election, but not later than at least 60 days prior to the end of any statutory period wherein valid patent protection can be obtained in the United States after a publication, on sale, or public use. The Seller shall file patent applications in additional countries (including the European Patent Office and Under the Patent Cooperation Treaty) within either 10 months of the corresponding initial patent application or 6 months from the date permission is granted by the Commissioner of Patents and Trademarks to file foreign patent applications where foreign filing has been prohibited by a Secrecy Order.

(4) Requests for extension of the time for disclosure to the Patent Counsel, election, and filing may, at the discretion of DOE, be granted, and will normally be granted unless the Patent Counsel has reason to believe that a particular extension would prejudice the Government's interest.

(d) Conditions when the Government may obtain title notwithstanding an existing waiver. The Seller shall convey to DOE, upon written request, title to any subject invention-- (1) If the Seller elects not to retain title to a subject invention;

(2) If the Seller fails to disclose or elect the subject invention within the times specified in paragraph (c) of this clause (provided that DOE may only request title within 60 days after learning of the Seller's failure to report or elect within the specified times);

(3) In those countries in which the Seller fails to file patent applications within the times specified in paragraph (c) of this clause; provided, however, that if the Seller has filed a patent application in a country after the times specified in paragraph (c) of this clause, but prior to its receipt of the written request of DOE, the Seller shall continue to retain title in that country;

(4) In any country in which the Seller decides not to continue the prosecution of any application for, to pay the maintenance fees on, or defend in reexamination or opposition proceeding on, a patent on subject invention; or

(5) If the waiver authorizing the use of this clause is terminated as provided in paragraph (p) of this clause.

(e) Minimum rights to Seller when the Government retains title. (1) The Seller shall retain a nonexclusive, royalty-free license throughout the world in each subject invention to which the Government obtains title under paragraph (d) of this clause except if the Seller fails to disclose the subject invention within the times specified in paragraph (c) of this clause. The Seller's license extends to its domestic subsidiaries and affiliates, if any, within the corporate structure of which the Seller is a part and includes the right to grant sublicenses of the same scope to the extent the Seller was legally obligated to do so at the time the contract was awarded. The license is transferrable only with the approval of DOE except when transferred to the successor of that part of the Seller's business to which the invention pertains.

(2) The Seller's domestic license may be revoked or modified by DOE to the extent necessary to achieve expeditious practical application of the subject invention pursuant to an application for an exclusive license submitted in accordance with applicable provisions in 37 CFR part 404 and DOE licensing regulations. This license shall not be revoked in that field of use or the geographical areas in which the Seller has achieved practical application and continues to make the benefits of the invention reasonably accessible to the public. The license in any foreign country may be revoked or modified at the discretion of DOE to the extent the Seller, its licensees, or its domestic subsidiaries or affiliates have failed to achieve practical application in that foreign country.

(3) Before revocation or modification of the license, DOE shall furnish the Seller a written notice of its intention to revoke or modify the license, and the Seller shall be allowed 30 days (or such other time as may be authorized by DOE for good cause shown by the Seller) after the notice to show cause why the license should not be revoked or modified. The Seller has the right to appeal, in accordance with applicable agency licensing regulations and 37 CFR part 404 concerning the licensing of Government-owned inventions, any decision concerning the revocation or modification of its license.

(f) Seller action to protect the Government's interest. (1) The Seller agrees to execute or to have executed and promptly deliver to DOE all instruments necessary to: (i) establish or confirm the rights the Government has throughout the world in those subject inventions to which the Seller elects to retain title, and

(ii) convey title to DOE when requested under paragraphs (d) and (o)(2) of this clause, and to enable the Government to obtain patent protection throughout the world in that subject invention.

(2) The Seller agrees to require, by written agreement, its employees, other than clerical and nontechnical employees, to disclose promptly in writing to personnel identified as responsible for the administration of patent matters and in a format suggested by the Seller each subject invention made under contract in order that the Seller can comply with the disclosure provisions of paragraph (c) of this clause, and to execute all papers necessary to file patent applications on subject inventions and to establish the Government's rights in the subject inventions. This disclosure format should require, as a minimum, the information required by paragraph (c)(1) of this clause. The Seller shall instruct such employees through employee agreements or other suitable educational programs on the importance of reporting inventions in sufficient time to permit the filing of patent applications prior to U.S. or foreign statutory bars.

(3) The Seller shall notify DOE of any decision not to continue the prosecution of a patent application, pay maintenance fees, or defend in a reexamination or opposition proceeding on a patent, in any country, not less than 30 days before the expiration of the response period required by the relevant patent office.

(4) The Seller agrees to include, within the specification of any United States patent application and any patent issuing thereon covering a subject invention, the following statement:

"This invention was made with Government support under (identify the subcontract) awarded by or for DOE. The Government has certain rights in this invention."

(5) The Seller shall establish and maintain active and effective procedures to assure that subject inventions are promptly identified and disclosed to Seller personnel responsible for patent matters within 6 months of conception and/or first actual reduction to practice, whichever occurs first in the course of or under this subcontract. These procedures shall include the maintenance of laboratory notebooks or equivalent records and other records as are reasonably necessary to document the conception and/or the first actual reduction to practice of subject inventions and records that show that the procedures for identifying and disclosing the inventions are followed. Upon request, the Seller shall furnish the Patent Counsel a description of such procedures for evaluation and for determination as to their effectiveness.

(6) The Seller agrees, when licensing a subject invention, to arrange to avoid royalty charges on acquisitions involving Government funds, including funds derived through Military Assistance Program of the Government or otherwise derived through the Government; to refund any amounts received as royalty charges on the subject invention in acquisitions for, or on behalf of, the Government; and to provide for such refund in any instrument transferring rights in the invention to any party.

(7) The Seller shall furnish the Patent Counsel the following:

(i) Interim reports every 12 months (or such longer period as may be specified by the Patent Counsel) from the date of the subcontract, listing subject inventions during that period and certifying that all subject inventions have been disclosed or that there are no such inventions.

(ii) A final report, within 3 months after completion of the subcontracted work, listing all subject inventions or certifying that there were no such inventions, and listing all subcontracts at any tier containing a patent rights clause or certifying that there were no such subcontracts.

(8) The Seller shall promptly notify the Patent Counsel in writing upon the award of any subcontract at any tier containing a patent rights clause by identifying the subcontractor, the applicable patent rights clause, the work to be performed under the subcontract, and the dates of award and estimated completion. Upon request of the Patent Counsel, the Seller shall furnish a copy of such subcontract, and no more frequently than annually, a listing of the subcontracts that have been awarded.

(9) The Seller shall provide, upon request, the filing date, serial number and title, a copy of the patent application (including an English-language version if filed in a language other than English), and patent number and issue date for any subject invention for which the Seller has retained title.

(10) Upon request, the Seller shall furnish the Government an irrevocable power to inspect and make copies of the patent application file.

(g) Subcontracts. (1) Unless otherwise directed by the Company, the Seller shall include the clause at 48 CFR 952.227-11, suitably modified to identify the parties, in all subcontracts, regardless of tier, for experimental, developmental, demonstration or research work to be performed

by a small business firm or nonprofit organization, except where the work of the subcontract is subject to an Exceptional Circumstances Determination by DOE. In all other subcontracts, regardless of tier, for experimental, developmental, or research work, the Seller shall include the patent rights clause at 48 CFR 952.227-13 (suitably modified to identify the parties).

(2) The Seller shall not, as part of the consideration for awarding the subcontract, obtain rights in the subcontractor's subject inventions.

(3) In the case of subcontractors at any tier, the Department, the subcontractor, and Seller agree that the mutual obligations of the parties created by this clause constitute a contract between the subcontractor and the Department with respect to those matters covered by this clause.

(4) The Seller shall promptly notify the Company in writing upon the award of any subcontract at any tier containing a patent rights clause by identifying the subcontractor, the applicable patent rights clause, the work to be performed under the subcontract, and the dates of award and estimated completion. Upon request of the Company, the Seller shall furnish a copy of such subcontract, and, no more frequently than annually, a listing of the subcontracts that have been awarded.

(h) Reporting on utilization of subject inventions. The Seller agrees to submit on request periodic reports no more frequently than annually on the utilization of a subject invention or on efforts at obtaining such utilization that are being made by the Seller and any of its licensees or assignees. Such reports shall include information regarding the status of development, date of first commercial sale or use, gross royalties received by the Seller, and such other data and information as DOE may reasonably specify. The Seller also agrees to provide additional reports as may be requested by DOE in connection with any march-in proceedings undertaken by DOE in accordance with paragraph (j) of this clause. To the extent data or information supplied under this paragraph is considered by the Seller, its licensee or assignee to be privileged and confidential and is so marked, DOE agrees that, to the extent permitted by law, it shall not disclose such information to persons outside the Government.

(i) Preference for United States Industry. Notwithstanding any other provisions of this clause, the Seller agrees that neither it nor any assignee will grant to any person the exclusive right to use or sell any subject invention in the United States unless such person agrees that any products embodying the subject invention will be manufactured substantially in the United States. However, in individual cases, the requirement for such an agreement may be waived by DOE upon showing by the Seller or its assignee that reasonable but unsuccessful efforts have been made to grant licenses on similar terms to potential licensees that would be likely to manufacture substantially in the United States or that under the circumstances domestic manufacture is not commercially feasible.

(j) March-in rights. The Seller agrees that with respect to any subject invention in which it has acquired title, DOE has the right in accordance with the procedures in 48 CFR 27.304-1(g) to require the Seller, an assignee, or exclusive licensee of a subject invention to grant a nonexclusive, partially exclusive, or exclusive license in any field of use to a responsible applicant or applicants, upon terms that are reasonable under the circumstances, and if the Seller, assignee, or exclusive licensee refuses such a request, DOE has the right to grant such a license itself if DOE determines that-- (1) Such action is necessary because the Seller or assignee has not taken, or is not expected to take within a reasonable time, effective steps to achieve practical application of the subject invention in such field of use;

(2) Such action is necessary to alleviate health or safety needs which are not reasonably satisfied by the Seller, assignee, or their licensees;

(3) Such action is necessary to meet requirements for public use specified by Federal regulations and such requirements are not reasonably satisfied by the Seller, assignee, or licensees; or

(4) Such action is necessary because the agreement required by paragraph (i) of this clause has not been obtained or waived or because a licensee of the exclusive right to use or sell any subject invention in the United States is in breach of such agreement.

(k) Background Patents. (1) The Seller agrees:

(i) to grant to the Government a royalty-free, nonexclusive license under any Background Patent for purposes of practicing a subject of this subcontract by or for the Government in research, development, and demonstration work only.

(ii) that upon written application by DOE, it will grant to responsible parties for purposes of practicing a subject of this subcontract nonexclusive licenses under any Background Patent on terms that are reasonable under the circumstances. If, however, the Seller believes that exclusive or partially exclusive rights are necessary to achieve expeditious commercial development or utilization, then a request may be made to DOE for DOE approval of such licensing by the Seller.

(2) Notwithstanding paragraph (k)(1)(ii), the Seller shall not be obligated to license any Background Patent if the Seller demonstrates to the satisfaction of the Secretary or his designee that:

(i) a competitive alternative to the subject matter covered by said Background Patent is commercially available or readily introducible from one or more other sources; or

(ii) the Seller or its licensees are supplying the subject matter covered by said Background Patent in sufficient quantity and at reasonable prices to satisfy market needs, or have taken effective steps or within a reasonable time are expected to take effective steps to so supply the subject matter.

(l) Background Data. (1) The Seller agrees to and does hereby grant to the Government a royalty-free, nonexclusive license to any background data for purposes of practicing a subject of this subcontract by or for the Government in research, development, and demonstration work only.

(2) The Seller also agrees that upon written application by DOE, it will grant to responsible parties, for purposes of practicing a subject of this subcontract, nonexclusive licenses, under any background data on terms that are reasonable under the circumstances. If, however, the Seller believes that exclusive rights are necessary to achieve expeditious commercial development or utilization, then a request may be made to DOE for DOE approval of such licensing by the Seller.

(3) Notwithstanding subparagraph (2) of this clause, the Seller shall not be obligated to license any background data if the Seller demonstrates to the satisfaction of the Secretary of Energy or designee that:

(i) A competitive alternative to the subject matter covered by said background data is commercially available or readily introducible from one or more other sources; or

(ii) The Seller or its licensees are supplying the subject matter covered by said background data in sufficient quantity and at reasonable prices to satisfy market needs, or have taken effective steps or within a reasonable time are expected to take effective steps to so supply the subject matter.

(m) Communications. All reports and notifications required by this clause shall be submitted to the Patent Counsel unless otherwise instructed.

(n) Other inventions. Nothing contained in this clause shall be deemed to grant to the Government any rights with respect to any invention

other than a subject invention, except with respect to Background Patents, above.

(o) Examination of records relating to inventions. (1) DOE or any authorized representative shall, until three years after final payment under this subcontract, have the right to examine any books (including laboratory notebooks), records and documents of the Seller relating to the conception or first actual reduction to practice of inventions in the same field of technology as the work under this subcontract to determine whether--

- (i) Any such inventions are subject inventions;
- (ii) The Seller has established and maintains the procedures required by paragraphs (f)(2) and (f)(5) of this clause; and
- (iii) The Seller and its inventor have complied with the procedures.

(2) If DOE determines that an inventor has not disclosed a subject invention to the Seller in accordance with the procedures required by paragraph (f)(5) of this clause, DOE may, within 60 days after the determination, request title in accordance with paragraphs (d)(2) and (d)(3) of this clause. However, if the Seller establishes that the failure to disclose did not result from the Seller's fault or negligence, DOE shall not request title.

(3) If DOE learns of an unreported Seller invention which DOE believes may be a subject invention, the Seller may be required to disclose the invention to DOE for a determination of ownership rights.

(4) Any examination of records under this paragraph shall be conducted in such a manner as to protect the confidentiality of the information involved.

(p) Withholding of payment. NOTE: this paragraph does not apply to the Seller's lower -tier subcontracts or grants. (1) Any time before final payment under this subcontract, the Company may, in the Government's interest, withhold payment until a reserve not exceeding \$50,000 or five percent of the amount of the subcontract, whichever is less, shall have been set aside if, in the Company's opinion the Seller fails to:

(i) Establish, maintain, and follow effective procedures for identifying and disclosing subject inventions pursuant to paragraph (f)(5) of this clause

- (ii) Disclose any subject invention pursuant to paragraph (c)(1) of this clause
- (iii) Deliver acceptable interim reports pursuant to paragraph (f)(7)(i) of this clause; or
- (iv) Provide the information regarding subcontracts pursuant to paragraph (f)(6) of this clause
- (v) Convey to the Government, using a DOE-approved form, the title and/or rights of the Government in each subject invention as required by this clause.

(2) Such reserve or balance shall be withheld until the Company has determined that the Seller has rectified whatever deficiencies exist and has delivered all reports, disclosures, and other information required by this clause.

(3) Final payment under this subcontract shall not be made before the Seller delivers to the Patent Counsel all disclosures of subject inventions required by paragraph (c)(1) of this clause, an acceptable final report pursuant to paragraph (f)(7)(ii) of this clause, and all past due confirmatory instruments, and the Patent Counsel has issued a patent clearance certification to the Company.

(4) The Company may decrease or increase the sums withheld up to the maximum authorized above. If the maximum amount authorized above is already being withheld under other provisions of the subcontract, no additional amount shall be withheld under this paragraph. The withholding of any amount or the subsequent payment thereof shall not be construed as a waiver of any Company or Government right.

(q) Waiver Terminations. Any waiver granted to the Seller authorizing the use of this clause (including any retention of rights pursuant thereto by the Seller under paragraph (b) of this clause) may be terminated at the discretion of the Secretary or his designee in whole or in part, if the request for waiver by the Seller is found to contain false material statements or nondisclosure of material facts, and such were specifically relied upon by DOE in reaching the waiver determination. Prior to any such termination, the Seller will be given written notice stating the extent of such proposed termination and the reasons therefor, and a period of 30 days, or such longer period as the Secretary or his designee shall determine for good cause shown in writing, to show cause why the waiver of rights should not be so terminated. Any waiver termination shall be subject to the Seller's minimum license as provided in paragraph (e) of this clause.

(r) Atomic Energy. No claim for pecuniary award or compensation under the provisions of the Atomic Energy Act of 1954, as amended, shall be asserted by the Seller or its employees with respect to any invention or discovery made or conceived in the course of or under this subcontract.

(s) Publication. It is recognized that during the course of work under this subcontract, the Seller or its employees may from time to time desire to release or publish information regarding scientific or technical developments conceived or first actually reduced to practice in the course of or under this subcontract. In order that public disclosure of such information will not adversely affect the patent interests of DOE or the Seller, approval for release of publication shall be secured from Patent Counsel prior to any such release or publication. In appropriate circumstances, and after consultation with the Seller, Patent Counsel may waive the right of prepublication review.

(t) Forfeiture of rights in unreported subject inventions. (1) The Seller shall forfeit and assign to the Government, at the request of the Secretary of Energy or designee, all rights in any subject invention which the Seller fails to report to Patent Counsel within six months after the time the Seller:

- (i) Files or causes to be filed a United States or foreign patent application thereon; or
- (ii) Submits the final report required by paragraph (e)(2)(ii) of this clause, whichever is later.

(2) However, the Seller shall not forfeit rights in a subject invention if, within the time specified in paragraph (m)(1) of this clause, the Seller:

- (i) Prepares a written decision based upon a review of the record that the invention was neither conceived nor first actually reduced to practice in the course of or under the subcontract and delivers the decision to Patent Counsel, with a copy to the Company; or
- (ii) Contending that the subject invention is not a subject invention, the Seller nevertheless, discloses the subject invention and all facts pertinent to this contention to the Patent Counsel, with a copy to the Company, or
- (iii) Establishes that the failure to disclose did not result from the Seller's fault or negligence.

(3) Pending written assignment of the patent application and patents on a subject invention determined by DOE to be forfeited, the Seller shall be deemed to hold the invention and the patent applications and patents pertaining thereto in trust for the Government. The forfeiture provision of this paragraph shall be in addition to and shall not supersede any other rights and remedies which the Government may have with respect to subject inventions.

(u) U.S. Competitiveness. The Seller agrees that any products embodying any waived invention or produced through the use of any waived invention will be manufactured substantially in the United States, unless the Seller can show to the satisfaction of DOE that it is not commercially

feasible to do so. In the event DOE agrees to foreign manufacture, there will be a requirement that the Government's support of the technology be recognized in some appropriate manner, e.g., recoupment of the Government's investment, etc. The Seller further agrees to make the above condition binding on any assignee or licensee or any entity otherwise acquiring rights to any waived invention, including subsequent assignees or licensees. Should the Seller or other such entity receiving rights in any waive invention undergo a change in ownership amounting to a controlling interest, then the waiver, assignment, license, or other transfer of rights in the waived invention is suspended until approved in writing by DOE