



# S B I R

## Environmental Technologies for Mobile Source Emissions

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Special Phase I Solicitation No. PR-NC-02-10153

Issue Date: **January 31, 2002**

Closing Date: **March 21, 2002 \***

**\* CAUTION** - See Section V, Paragraph J.9(c), Instructions to Offerors, concerning Late Proposals and Modifications.

Your proposal with an **original and nine (9) copies** (including all appendices) shall be received at one of the following addresses by **12:00 p.m. (noon) local time on March 21, 2002.**

**U.S. MAIL:**

U.S. Environmental Protection Agency  
Attention: Antonio Leathers, Mobile Sources SBIR  
RTP Procurement Operations Division (D143-01)  
Research Triangle Park, NC 27711

**HAND-CARRIED/COURIER ADDRESS:**

U.S. Environmental Protection Agency  
Attention: Antonio Leathers, Mobile Sources SBIR  
RTP Procurement Operations Division (D143-01)  
4930 Old Page Road  
Research Triangle Park, NC 27709

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# Special SBIR Phase I Solicitation Control and Monitoring of Mobile Source Emissions

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ISSUE DATE: January 31, 2002  
CLOSING DATE: March 21, 2002 \*

\* CAUTION - See Section V, Paragraph J.9(c),  
Instructions to Offerors, concerning Late Proposals  
and Modifications

## I. PROGRAM DESCRIPTION

A. The Environmental Protection Agency (EPA) invites small business firms to submit research proposals under this special Small Business Innovation Research (SBIR) Solicitation entitled "Environmental Technologies for Control and Monitoring of Mobile Source Emissions." The SBIR program is a phased process uniform throughout the Federal Government of soliciting proposals and awarding funding agreements for research (R) or research and development (R&D) to meet stated agency needs or missions.

While this special SBIR solicitation only covers mobile source emissions, EPA issues other SBIR solicitations covering pollution prevention, air and water pollution control, solid and hazardous waste management, and environmental monitoring and analytical technologies where the research will serve as a base for technological innovation and commercialization. The proposed research must directly pertain to EPA's environmental mission and must be responsive to EPA program interests included in the topic descriptions in the solicitation.

In order to facilitate proposal reviews by external peer reviewers with specialized expertise and by EPA technical personnel with focused program needs and priorities, offerors must designate a research topic for their proposal.

The same proposal may not be submitted under more than one topic and the same proposal cannot be submitted under any other EPA SBIR solicitation issued in 2002. An organization may submit separate proposals on different topics or different proposals on the same topic as long as the proposals are not duplicates of the same research principle modified to fit the topic. If such duplicates are submitted, only one will be reviewed. Refer to Sections IV, V, and VII for additional requirements. Where similar research is discussed under more than one topic, the offeror should choose the topic most relevant to the proposed research. It is the complete responsibility of offerors to select and identify the best topic for their proposals.

B. Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in this solicitation by the time specified in this solicitation. See Section V, Paragraph J.9(c), Instructions to Offerors, concerning Late Proposals and Modifications.

### **THIS SOLICITATION IS FOR SPECIAL SBIR PHASE I ONLY.**

To stimulate and foster technological innovation, including increasing private sector applications of federal research or R&D, EPA's program follows the SBIR program's uniform process:

(1) **PHASE I.** Phase I involves a solicitation of proposals to conduct feasibility related experimental research or R&D related to described agency requirements. The objective of this phase is to determine the technical feasibility and preliminary commercialization potential of the proposed effort and the quality of performance of the small concern with a relatively small Agency investment before consideration of further federal support in Phase II. The Government is not obligated to fund any specific Phase I proposal. The maximum dollar amount of this special Phase I mobile sources solicitation is \$100,000 and the term of performance should not exceed 10 months. The Phase I Technical Objectives and Phase I Work Plan described in Section III(D)(2 and 3) of this solicitation requires a separate description of the objectives and work plan for the first six (6) months of Phase I and the objectives and work plan for months 7-10 that bridges the first 6 months of Phase I with the Phase II program.

(2) **PHASE II.** Phase II proposals may only be submitted by Phase I award winners invited to submit proposals. Phase II is the principal research or R&D effort and Phase II projects under this solicitation should normally be

completed in 12 months. The objective is to continue the research or R&D initiated under Phase I and work toward commercialization of the technology. Phase II awards are expected to include full-scale testing of the technology, but may not necessarily complete the total research and development that may be required to satisfy commercial or federal needs beyond the SBIR program. Completion of the research and development may be through Phase III. The Agency is under no obligation to fund any proposal or any specific number of proposals in a given topic. It also may elect to fund several or none of the proposed approaches to the same topic.

It is anticipated that 5 to 10 Phase II awards will be made, each with a dollar amount of \$225,000 and a twelve (12) month term of performance. For Phase II, the Agency is planning to offer a Phase II Option under which Phase II offerors may submit a proposal for \$100,000 additional funding to expand R&D efforts to accelerate the project from full-scale testing and demonstration to full commercialization. EPA federal funds must be designated strictly for advancing the research-related elements of the project. No automatic preference shall be given to offers that address the option; however, in the case where an offeror addresses the option in its proposal, the entire proposal including the option shall be evaluated. The Agency would have a unilateral right to exercise the option after EPA's acceptance of the company's detailed commercialization plan, including documentation showing that at least \$100,000 was transferred to the contractor from one or more third-party investors, such as a venture capital firm, an "angel" investor, local, state or federal non-SBIR funding source, or another company under a partnership, licensing or joint venture arrangement, or any combination of third parties. The Government is not obligated to fund any specific Phase II proposal.

For technologies awarded Phase I contracts under this solicitation, the follow-on Phase II solicitation will be issued during Phase I. We expect to open the solicitation on/about Phase I month 4.5 (February 8, 2003) and proposals will be due on/about Phase I month 6.5 (April 15, 2003). Each Phase II proposal will be evaluated on the results of the first six (6) months of Phase I, the Phase II program (including the Months 7-10 Work Plan that bridges the first 6 months of Phase I and Phase II), and the commercial potential of the Phase II proposal. The evaluation criteria are as follows:

#### **PHASE II CRITERIA**

1. Results of the first 6 months of Phase I and degree to which research objectives and identified customer needs were met. Demonstration of performance/cost

effectiveness and environmental benefits associated with the proposed research, including risk reduction potential.

2. Quality and soundness of the Phase II research plan (including any changes in the Phase I Months 7-10 Work Plan) to establish the technical and commercial viability of the proposed concept as evidenced through technology prototypes or initial commercial demonstrations.

3. Qualifications of the principal/key investigator, supporting staff, and consultants. Time commitment of principal/key investigator, adequacy of equipment and facilities, and proposed budget to accomplish the proposed research. Adequacy of Phase II Quality Assurance Summary.

4. Potential of the proposed concept for significant commercialization applications. The quality and adequacy of the commercialization plan to produce an innovative product, process, or device and getting technology prototypes or initial Phase II applications into commercial production and sales.

5. The offeror's SBIR or other research commercialization record. Existence of second phase funding commitments from private sector or non-SBIR funding sources. Existence of third phase follow-on commitments and presence of other indicators of commercial potential of the idea.

(3) **PHASE III.** Where appropriate and needed in order to complete the research and development, there may be a third phase which is funded by:

1. Non-federal sources of capital for commercial applications of SBIR funded research or research and development.

2. Federal Government with non-SBIR federal funds for SBIR-derived products and processes that will be used by the Federal Government.

3. Non-SBIR federal funds for the continuation of research or research and development that has been competitively selected using peer review or scientific review criteria.

C. Each offeror submitting a proposal must qualify as a small business for research or R&D purposes at the time of award. In addition, the primary employment of the principal investigator must be with the small business firm at the time of award and during the conduct of the proposed

research. Principal investigators who appear to be employed by a university must submit a letter from the university stating that the principal investigator, if awarded an SBIR contract, will become a less-than-half-time employee of the university. Also, a principal investigator who appears to be a staff member of both the applicant and another employer must submit a letter from the second employer stating that, if awarded an SBIR contract, he/she will become a less-than-half-time employee of such organization. Letters demonstrating that these requirements have been fulfilled must be submitted prior to contract award to the addressee stated in Section VI of this solicitation. Failure to do so may jeopardize award. Also, for both Phase I and Phase II, the research or R&D work must be performed in the United States. "United States" means the 50 states, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia.

**D. For Phase I, the Government anticipates the award of approximately \$1.0 M in firm-fixed-price contracts at approximately \$100,000 each including profit,** but reserves the right to change either the number of awards or the amount of the individual awards depending on the outcome of the selection process. The contractor's period of performance is expected to be 10 months. Award of any contract(s) resulting from this solicitation shall be to the responsible offeror(s) with the highest rankings after evaluation in accordance with Section IV. Source selection will not be based on a comparison of cost or price. However, cost or price will be evaluated to determine whether the price, including any proposed profit, is fair and reasonable and whether the offeror understands the work and is capable of performing the contract.

E. All inquiries concerning this solicitation shall be submitted to the following E-mail address:

leathers.antonio@epa.gov

If e-mail is not available to you, written or telephone inquiries may be directed to:

U.S. Environmental Protection Agency  
Attention: Antonio Leathers, Mobile Sources SBIR  
RTP Procurement Operations Division (D143-01)  
Research Triangle Park, NC 27711  
(919) 541-2312

Potential offerors are encouraged to communicate via e-mail.

## II. DEFINITIONS

For purposes of this solicitation, the following definitions apply:

**Research or Research and Development (R/R&D):** Any activity that is:

- (1) A systematic, intensive study directed toward greater knowledge or understanding of the subject studied.
- (2) A systematic study directed specifically toward applying new knowledge to meet a recognized need.
- (3) A systematic application of knowledge toward the production of useful materials, devices, and systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.

**Funding Agreement:** Any contract, grant, or cooperative agreement entered into between any federal agency and any small business concern for the performance of experimental, developmental, or research work funded in whole or in part by the Federal Government.

**Subcontract:** Any agreement, other than one involving an employer-employee relationship, entered into by a Federal Government funding agreement awardee calling for supplies or services required solely for the performance of the original funding agreement.

**Small Business Concern:** A small business concern is one that, at the time of award of Phase I and Phase II funding agreements, meets the following criteria:

- (1) Is independently owned and operated, is not dominant in the field of operation in which it is proposing, has its principal place of business located in the United States, and is organized for profit;
- (2) Is at least 51 percent owned, or in the case of a publicly owned business, at least 51 percent of its voting stock is owned by United States citizens or lawfully fully admitted permanent resident aliens (if this applies, appropriate documentation must be submitted);
- (3) Has, including its affiliates, a number of employees not exceeding 500, and meets the other regulatory requirements found in 13 CFR Part 121. Business concerns, other than investment companies

licensed, or state development companies qualifying under the Small Business Investment Act of 1958, 15 U.S.C. 661, et. seq., are affiliates of one another when either directly or indirectly:

(A) one concern controls or has the power to control the other; or

(B) a third party or parties controls or has the power to control both.

Control can be exercised through common ownership, common management, and contractual relationships. The term “affiliates” is defined in greater detail in 13 CFR 121. The term “number of employees” is defined in 13 CFR 121. Business concerns include, but are not limited to, any individual, partnership, corporation, joint venture, association, or cooperative.

**Socially and Economically Disadvantaged Small Business Concern:** A socially and economically disadvantaged small business concern is one that is:

- (1) At least 51 percent owned by (i) an Indian tribe or a native Hawaiian organization, or (ii) one or more socially and economically disadvantaged individuals, and
- (2) Whose management and daily business operations are controlled by one or more socially and economically disadvantaged individuals.

**Socially and Economically Disadvantaged Individual:** A member of any of the following groups:

- (1) Black Americans;
- (2) Hispanic Americans;
- (3) Native Americans (American Indians, Eskimos, Aleuts, or Native Hawaiians);
- (4) Asian-Pacific Americans (persons with origins from Burma, Thailand, Malaysia, Indonesia, Singapore, Brunei, Japan, China, Taiwan, Laos, Cambodia (Kampuchea), Vietnam, Korea, The Philippines, U.S. Trust Territory of the Pacific Islands (Republic of Palau), Republic of the Marshall Islands, Federated States of Micronesia, the Commonwealth of the Northern Mariana Islands, Guam, Samoa, Macao, Hong Kong, Fiji, Tonga, Kiribati, Tuvalu, or Nauru);
- (5) Subcontinent Asian (Asian-Indian) Americans (persons with origins from India, Pakistan,

Bangladesh, Sri Lanka, Bhutan, the Maldives Islands, or Nepal); and

(6) Members of other groups designated from time to time by SBA pursuant to Section 124.103 of 13 CFR Ch.1 (1-1-99 edition).

**Women-Owned Small Business Concern:** A small business concern that is at least 51 percent owned by a woman or women who also control and operate it. “Control” in this context means exercising the power to make policy decisions. “Operate” in this context means being actively involved in the day-to-day management.

**Primary Employment:** More than one-half of the principal investigator’s time is spent in the employ of the small business.

**United States:** The 50 states, the Territories and possessions of the United States, the Commonwealth of Puerto Rico, the Trust Territory of the Pacific Islands, and the District of Columbia.

**Commercialization:** The process of developing markets and producing and delivering products for sale (whether by the originating party or by others); as used here, commercialization includes both Government and commercial markets.

### III. PROPOSAL PREPARATION INSTRUCTIONS AND REQUIREMENTS

#### A. PROPOSAL PAGE LIMIT

Proposals submitted in response to this special Phase I of the SBIR program shall not exceed a total of **25 pages**, one side only. The only exception would be regarding the requirements set forth in Section III.D.12, “Prior SBIR Awards.” The **25 pages** should include the cover page, budget, and all enclosures or attachments. Pages should be of standard size (8 ½" x 11"; 21.6 cm x 27.9 cm) with 2.5 cm margins and type no smaller than 10 point font size. All pages must be consecutively numbered. **Proposals in excess of the 25-page limitation shall not be considered for review or award.** Any additional attachments, appendices, or references beyond the 25-page limitation shall result in the proposal not being considered for review or award. A letter of transmittal is not necessary. If one is

furnished, it must not be attached to every copy of the proposal. If a letter of transmittal is attached to every copy of the proposal, it will be counted as page 1 of the proposal. No binders are necessary. If binders are provided, they will be counted as pages even if no printing or writing is thereon.

## B. PROPOSAL COVER SHEET

The offeror shall photocopy (or download from the Internet) and complete Appendix A as page 1 of each copy of each proposal. **No other cover is permitted.** When downloading the solicitation from the Internet, Appendix A may print on two pages, but will only count as one page per Appendix. Offerors may reformat the forms to correct spacing and pagination errors, however, identical information must be provided.

The original of the cover sheet must contain the pen-and-ink signatures of the authorized negotiator and the person authorized to sign the proposal.

## C. ABSTRACT OR SUMMARY

The offeror shall complete Appendix B as page 2 of each proposal. Appendix B is limited to one page. The technical abstract should include a brief description of the problem or opportunity, the innovation, project objectives, and description of the effort. In summarizing anticipated results, the implications of the approach (for both Phases I and II) and the potential commercial applications of the research shall be stated. **THE ABSTRACT IS USED EXTENSIVELY DURING THE EXTERNAL PEER REVIEW AND EPA INTERNAL RELEVANCY REVIEW.** The project summary of successful proposals will be published by EPA and, therefore, must not contain proprietary information.

## D. TECHNICAL CONTENT

Begin the main body of the proposal on page 3. As a minimum, the following shall be included:

**1. IDENTIFICATION AND SIGNIFICANCE OF THE PROBLEM OR OPPORTUNITY.** A clear statement of the specific technical problem or opportunity addressed and the environmental benefits. **INFORMATION ON THE ENVIRONMENTAL BENEFITS ASSOCIATED WITH THE TECHNOLOGY IS A VERY IMPORTANT PART OF THE EXTERNAL PEER REVIEW AND EPA INTERNAL RELEVANCY REVIEW.**

**2. PHASE I OBJECTIVES/WORK PLAN FOR FIRST 6 MONTHS.** State the specific objectives of the first 6 months of Phase I, including the technical questions it will try to answer to determine the technical feasibility and preliminary commercialization potential of the proposed technology. The First 6 Months Work Plan should indicate what will be done, where it will be done, and how the R/R&D will be carried out. The work planned to achieve each objective or task should be discussed in detail to enable a complete scientific and technical evaluation of the work plan. A work schedule also should be provided.

**3. PHASE I OBJECTIVES/WORK PLAN FOR MONTHS 7-10.** This section provides a detailed description of the objectives and work plan for months 7-10 of Phase I. This section should describe the firm's plan to bridge the effort of the first 6 months of Phase I with the 12-month Phase II program. The Months 7-10 Work Plan should describe what will be done, where it will be done, and how the R/R&D will be carried out. The work planned to achieve each objective or task should be discussed in detail to enable a complete scientific and technical evaluation of the work plan. A work schedule also should be provided. If the findings and results of the first 6 months of Phase I dictate changes in the Months 7-10 Work Plan provided as part of the Phase I proposal, the contractor should notify EPA and request a modification of the Months 7-10 scope of work.

**4. RELATED RESEARCH OR R&D.** Describe significant research or R&D that is directly related to the proposal including any conducted by the project manager/principal investigator or by the proposing firm. Describe how it relates to the proposed effort, and any planned coordination with outside sources. Offerors must demonstrate their awareness of key recent research or R&D conducted by others in the specific topic area by providing appropriate references from the literature and other published documents.

**5. KEY PERSONNEL AND BIBLIOGRAPHY OF DIRECTLY RELATED WORK.** Identify key personnel involved in Phase I including their directly related education, experience, and bibliographic information. Where vitae are extensive, summaries that focus on the most relevant experience or publications are desired and may be necessary to meet proposal size limitations.



**6. RELATIONSHIP WITH FUTURE RESEARCH OR RESEARCH AND DEVELOPMENT.**

State the anticipated results of the proposed approach if the project is successful (Phase I and II). A discussion of cost-effectiveness is paramount, especially comparing the state-of-the-art approaches with the proposed approach. Discuss the significance of the Phase I effort in providing a foundation for the Phase II R/R&D effort.

**7. FACILITIES.** A detailed description, availability and location of instrumentation and physical facilities proposed for Phase I should be provided.

**8. CONSULTANTS.** Involvement of consultants in the planning and research stages of the project is permitted. If such involvement is intended, it should be described in detail and vitae should be provided.

**9. COMMERCIALIZATION PLAN.** Provide an abbreviated 2-3 page plan related directly to producing an innovative product, process, or device and getting it into commercial production and sales. Comprehensive business plans (that are company rather than project oriented) are not desired. The Phase I plan is a roadmap toward producing a detailed Phase II Commercialization Plan, which will be required as part of the Phase II Application.

NOTE: The Small Business Research and Development Enhancement Act of 1992 allows discretionary technical assistance to SBIR awardees. The Agency may provide up to \$4,000 of SBIR funds for technical assistance per award. EPA intends to provide Phase I awardees with technical assistance through a separate EPA arrangement. For Phase I, this assistance will be in addition to the award amount. For Phase II, the law allows each awardee to expend up to \$4,000 per year of the award amount for technical assistance services.

The Phase I plan should provide limited information on the subjects described below. Explain what will be done during Phase I to decide on applications, markets, production, and financing. The Commercialization Plan should address:

a. *SBIR Project:* Brief description of the company, its principal field(s) of interest, size and current products and sales. A concise description of the SBIR project and its key technical objectives.

b. *Commercial Applications:* Potential commercial applications of the research results specifying customers and specific needs that will be satisfied. Do

you have or intend to file for one or more patents as a result of the SBIR project?

c. *Competitive Advantages:* What is particularly innovative about the anticipated technology or products? (Innovation may be expressed in terms of applications, performance, efficiencies, or reduced cost. To determine if your innovation is likely to result in intellectual property that may be legally protected, it helps to conduct a patent search and look for related work being funded by EPA or another federal agency. A fact sheet on how to search for patents and related federally-funded work is provided in Appendix E.) What significant advantages in application, performance, technique, efficiency, or costs do you anticipate your new technology will have over existing technology? (In order to assess such advantages, it is useful to compare the anticipated performance of your technology against substitutable products currently being sold or emerging out of R&D. If regulations, industry standards, or certifying requirements apply to your technology or product, these provide useful criteria for comparing your anticipated performance with potentially competing technology and products. However, other expressions of end-user needs also may contain important criteria).

d. *Markets:* What are the anticipated specific markets for the resulting technology, their estimated size, classes of customers, and your estimated market share 5 years after the project is completed and/or first sales? Who are the major competitors in the markets, present and/or anticipated?

e. *Commercialization:* Briefly describe how you plan to produce your product. Do you intend to manufacture it yourself, subcontract the manufacturing, enter into a joint venture or manufacturing agreement, license the product, etc.? Briefly describe the approach and steps you plan to take to commercialize the research results to significant sales. Do you plan to market the product yourself, through dealers, contract sales, marketing agreements, joint venture, sales representatives, foreign companies, etc.? How do you plan to raise money to support your commercialization plan?

**10. SIMILAR OR CLOSELY RELATED SBIR AWARDS.** If the small business concern has received ANY prior Phase I or Phase II award(s) from EPA or any federal agency for similar or closely related research, submit name of awarding agency, date of award, funding agreement number, amount, and topic or subtopic title. **DESCRIBE THE TECHNICAL**

**DIFFERENCES AND REASONS WHY THE PROPOSED NEW PHASE I RESEARCH IS DIFFERENT FROM RESEARCH CONDUCTED UNDER PRIOR SBIR AWARDS.** (This required proposal information **shall** be counted toward proposal pages count limitation.)

**11. DUPLICATE OR EQUIVALENT SBIR PROPOSALS.** A firm may elect to submit essentially equivalent work under other federal Program Solicitations. In these cases, a statement must be included in each such proposal indicating: the name and address of the agencies to which proposals were submitted or from which awards were received; date of proposal submission or date of award; title, number, and date of solicitations under which proposals were submitted or awards received; specific applicable research topics for each proposal submitted or award received; titles of research projects; and name and title of project manager or principal investigator for each proposal submitted or award received. (This information **shall** count toward proposal pages count limitation.)

**12. PRIOR SBIR AWARDS.** If the small business concern has received ANY prior Phase II award from any federal agency in the prior 5 fiscal years, submit name of awarding agency, date of award, funding agreement number, amount, topic or subtopic title, follow-on agreement amount, source and date of commitment, and current commercialization status for each Phase II. (This required proposal information shall be included as an attachment to the proposals and **shall not** be counted toward proposal pages count limitation.)

## **E. COST BREAKDOWN/ PROPOSED BUDGET**

Complete the budget form in Appendix C and include the form immediately after proposal Section D.11. Photocopy the form for the required copies for submission. Incorporate the copy of the budget form bearing the original signature into the copy of the proposal bearing the original signature on the cover page. The budget form will count as one page in the 25-page limit. If budget explanation pages are included, they will count toward the 25-page limit.

## **F. PHASE I QUALITY ASSURANCE NARRATIVE STATEMENT**

Offerors must state whether or not their proposal involves the performance of environmental technology, whether hardware based or via new techniques. This quality assurance narrative statement should not exceed 2 pages and will be included in the 25-page limitation for the proposal. The narrative statement must for each of the following items either address the required information or explain why the item does not apply to the proposed research.

1. Discuss the activities to be performed or hypothesis to be tested and criteria for determining acceptable data quality. (Note: Such criteria may be expressed in terms of precision, accuracy, representativeness, completeness, and comparability. These criteria also must be applied to determine the acceptability of existing or secondary data to be used in the project.)
2. Describe the study design, including sample type and location requirements, any statistical analyses that were used to estimate the types and numbers of samples required for physical samples, or equivalent information for studies using survey and interview techniques.
3. Describe the procedures for the handling and custody of samples, including sample collection, identification, preservation, transportation, and storage.
4. Describe the procedures that will be used in the calibration and performance evaluation of the sampling and analytical methods and equipment to be used during the project.
5. Discuss the procedures for data reduction and reporting, including a description of statistical analyses to be used and of any computer models to be designed or utilized with associated verification and validation techniques.
6. Describe the quantitative and/or qualitative procedures that will be used to evaluate the success of the project, including any plans for peer or other reviews of the study design or analytical methods prior to data collection.

A more detailed Proposal Quality Assurance Plan will be required in Phase II. The plan will be required as part of the first monthly report under the Phase II contract.

## IV. METHOD OF SELECTION AND EVALUATION CRITERIA

All Phase I proposals will be evaluated and judged on a competitive basis by peer reviewers from outside EPA. Proposals will be initially screened to determine responsiveness. As noted in Section III, proposals exceeding the 25-page limitation will not be considered for review or award. Also, as noted in Section I, any proposal addressing more than one research topic, or failing to identify the research topic by letter symbol on the cover page, will not be considered for review or award. Proposals passing this initial screening will be reviewed for technical merit by external peer panels of technical experts, using the technical evaluation criteria described in A.1 below. Each of the criteria are equal in value. These panels will assign each proposal an adjectival rating of “excellent,” “very good,” “good,” “fair,” or “poor” using the specified criteria. The proposals assigned “excellent” and “very good” ratings, then will be subjected to the relevancy review within EPA, to further evaluate these applications in relation to program priorities and balance using the criteria specified in A.2 below. Each proposal will be judged on its own merit. The Agency is under no obligation to fund any proposal or any specific number of proposals in a given topic. It also may elect to fund several or none of the proposed approaches to the same topic or subtopic.

### A. TECHNICAL EVALUATION CRITERIA

**1. EXTERNAL PEER REVIEW.** The external peer review panels will utilize the following evaluation criteria to rate each proposal. The criteria are of equal importance.

#### CRITERIA

a. The scientific and technical significance of the proposed technology and its appropriateness to the research topic. Quality and soundness of the research plan to establish the technical and commercial feasibility of the concept.

b. The uniqueness/ingenuity of the proposed concept or application as technological innovation. Originality and innovativeness of the proposed research toward meeting customer needs and achieving commercialization of the technology.

c. Potential demonstration of performance/cost effectiveness and environmental benefits associated with the proposed research, including risk reduction potential.

d. Qualifications of the principal/key investigator, supporting staff, and consultants. Time commitment of principal/key investigator, adequacy of equipment and facilities and proposed budget to accomplish the proposed research. Adequacy and quality of the Quality Assurance Narrative Statement.

e. Potential of the proposed concept for significant commercial applications. Potential for the commercialization plan to produce an innovative product, process, or device and getting it into commercial production and sales. Potential market and competition and other financial/business indicators of commercialization potential and the offeror’s SBIR or other research commercialization record.

All peer reviewers will be required to sign an agreement to protect the confidentiality of all proposal material, and to certify that no conflict of interest exists between the reviewer and the offeror. A copy of both forms is available upon request; however, the identity of the reviewer will not be released.

**2. EPA RELEVANCY REVIEW.** The proposals that received ratings of “excellent” or “very good” by the External Peer Review Panel will be subject to the relevancy review by EPA program managers using the criteria set forth below to select which of the “excellent” and “very good” proposals will be funded. Projects will not be funded where EPA determines the proposed research already is being supported by EPA or another known source. The evaluation criteria “a” through “c” are of equal value and will be used to evaluate the applications in relation to program priorities, balance, and relevancy.

#### CRITERIA

a. The potential of the technology to meet Agency program priorities and to strengthen the

overall balance of the SBIR program. How well the technology fits into EPA's overall research strategy or program within the Phase I research topic.

b. The potential of the technology for significant environmental benefits and for strengthening the scientific basis for risk assessment/risk management in the Agency research topic area.

c. The potential of the technology to have broad application or to impact large segments of the population.

## **B. RELEASE OF PROPOSAL REVIEW INFORMATION**

After final award decisions have been announced, the technical evaluations of the offeror's proposal will be provided to the offeror. The identity of reviewers shall not be disclosed.

## **V. CONSIDERATIONS**

### **A. AWARDS**

The Government anticipates award of approximately 10 firm-fixed-price contracts of up to \$100,000 each including profit. It is expected that these contracts will be awarded with a contract start date of October 1, 2002. The period of performance for the contracts should not exceed ten (10) months. The primary consideration in selecting proposals for award will be the technical merit of the proposal. Proposals shall be evaluated in accordance with the Technical Evaluation Criteria stated in IV.A. above. Source selection will not be based on a comparison of cost or price. However, cost or price will be evaluated to determine whether the price, including any proposed profit, is fair and reasonable and whether the offeror understands the work and is capable of performing the contract.

This current solicitation is for Phase I only, and the Government is not obligated to fund any specific Phase I proposal.

Funds are not presently available for this contract. The Government's obligation under this contract is contingent upon the availability of appropriated funds from which payment for contract purposes can be made. No legal liability on the part of the Government for any payment may arise until funds are made available to the Contracting Officer for this contract and until the Contractor

receives notice of such availability, to be confirmed in writing by the Contracting Officer.

## **B. REPORTS**

1. The Contractor shall furnish two (2) copies of a monthly letter report stating progress made. One (1) copy of the report shall be submitted to the Project Officer with one (1) copy to the Contract Specialist. The reports shall be submitted within 7 calendar days after the end of the reporting period. Specific areas of interest shall include progress made and difficulties encountered during the reporting period, and a statement of activities anticipated during the subsequent reporting period. The report shall include any changes in personnel associated with the project. Also, the first month's report shall contain a work plan and schedule of accomplishments for the subsequent months of the project. The Monthly Report shall include, as an attachment, a copy of the monthly voucher for the same period.

2. Two (2) copies of a comprehensive final report on the Phase I project must be submitted to the Project Officer by the completion date of the contract. The Contract Specialist shall receive one (1) copy. This final report shall include a single-page project summary as the first page, identifying the purpose of the research, a brief description of the research carried out, the research findings or results, and potential applications of the research in a final paragraph. The balance of the report should indicate in detail the research objectives, research work carried out, results obtained, and estimates of technical feasibility. The report should include a discussion of any commercialization activity carried out during Phase I as well as future commercialization plans.

3. Two (2) hard copies (and one copy on a disk in Word Perfect or ASCII format) of a publishable (cleared for the general public) 2-3 page Executive Summary of the final report for Phase I must be submitted to the Project Officer by the completion date of the contract. This special report should be a true summary of the report, including the purpose of the project, work carried out, and results. The summary should stress innovativeness and potential commercialization. The Executive Summary will be placed on the EPA SBIR Website, and therefore, it should include the specific results the company is willing to release to the public.

**C. PAYMENT SCHEDULE**

Phase I payments will be made as follows:

Ten percent (10%) of the total contract price upon receipt and acceptance of a proper invoice with each of the first nine monthly reports. The remainder shall be paid upon receipt and acceptance of the final report. Pursuant to the provisions of FAR 52.232-25, "Prompt Payment", payment will be rendered within thirty (30) days after receipt of a proper invoice.

**D. INNOVATIONS, INVENTIONS AND PATENTS**

**1. LIMITED RIGHTS INFORMATION AND DATA**

**a. Proprietary Information**

Information contained in unsuccessful proposals will remain the property of the offeror. The Government may, however, retain copies of all proposals. Public release of information in any proposal submitted will be subject to existing statutory and regulatory requirements.

If proprietary information is provided by an offeror in a proposal which constitutes a trade secret, proprietary commercial or financial information, confidential personal information, or data affecting the national security, it will be treated in confidence to the extent permitted by law, provided this information is clearly marked by the offeror with the term "confidential proprietary information" and provided the following legend appears on the title page of the proposal:

"For any purpose other than to evaluate the proposal, these data shall not be disclosed outside the Government and shall not be duplicated, used, or disclosed in whole or in part, provided that if a funding agreement is awarded to this offeror as a result of or in connection with the submission of this data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data subject to this restriction are contained in pages \_\_\_\_\_ of this proposal."

Any other legend may be unacceptable to the Government and may constitute grounds for removing the proposal from further consideration and without assuming any liability for inadvertent disclosure.

**b. Alternative to Minimize Proprietary Information**

Offerors shall limit proprietary information to only that absolutely essential to their proposal.

**c. Rights in Data Developed Under SBIR Funding Agreements**

The Contract will contain a data clause which will provide the following:

**SBIR RIGHTS NOTICE (MAR 1994)**

These SBIR data are furnished with SBIR rights under Contract No. \_\_\_\_\_ (and subcontract \_\_\_\_\_ if appropriate). For a period of four (4) years after acceptance of all items to be delivered under this contract, the Government agrees to use these data for Government purposes only, and they shall not be disclosed outside the Government (including disclosure for procurement purposes) during such period without permission of the Contractor, except that, subject to the foregoing use and disclosure prohibitions, such data may be disclosed for use by support Contractors. After the aforesaid 4-year period, the Government has a royalty-free license to use, and to authorize others to use on its behalf, these data for Government purposes, but is relieved of all disclosure prohibitions and assumes no liability for unauthorized use of these data by third parties. This Notice shall be affixed to any reproductions of these data, in whole or in part.

**d. Copyrights**

With prior written permission of the Contracting Officer, the Awardee normally may copyright and publish (consistent with appropriate national security considerations, if any) material developed with EPA support. EPA receives a royalty-free license for the Federal Government and requires that each publication contain an appropriate acknowledgment and disclaimer statement.

**e. Patents**

Small business concerns normally may retain the principal worldwide patent rights to any invention developed with Governmental support. The Government receives a royalty-free license for Federal Government use, reserves the right to require the patent holder to license others in certain circumstances, and requires that anyone exclusively licensed to sell the invention in the United States must normally manufacture it domestically. To the extent authorized by 35 U.S.C. 205, the Government will not make public any information disclosing a Government-

supported invention for a 4-year period to allow the Awardee a reasonable time to pursue a patent.

**E. COST SHARING**

Cost sharing is permitted for proposals under this Program Solicitation; however, cost sharing is not required nor will it be an evaluation factor in consideration of your proposal.

**F. FEE OR PROFIT**

Reasonable fee (estimated profit) will be considered under this solicitation. For guidance purposes, the amount of profit normally should not exceed 10% of total project costs.

**G. JOINT VENTURES OR LIMITED PARTNERSHIPS**

Joint ventures and limited partnerships are eligible provided the entity created qualifies as a small business as defined in this Program Solicitation.

**H. RESEARCH AND ANALYTICAL WORK**

1. For Phase I, a minimum of two-thirds of the research and/or analytical effort must be performed by the proposing small business concern unless otherwise approved in writing by the Contracting Officer.

2. For Phase II, a minimum of one-half of the research and/or analytical effort must be performed by the proposing small business concern unless otherwise approved in writing by the Contracting Officer.

**I. CONTRACTOR COMMITMENTS**

Upon award of a funding agreement, the Awardee will be required to make certain legal commitments through acceptance of numerous clauses in Phase I funding agreements. The outline that follows is illustrative of the types of clauses to which the Contractor would be committed. This list should not be understood to represent a complete list of clauses to be included in Phase I funding agreements, nor to be specific wording of such clauses. Copies of complete terms and conditions are available upon request.

**1. INSPECTION.** Work performed under the contract is subject to Government inspection and evaluation at all times.

**2. EXAMINATION OF RECORDS.** The Comptroller General (or a duly authorized representative) shall have the right to examine any directly pertinent records of the Awardee involving transactions related to this contract.

**3. DEFAULT.** The Government may terminate the contract if the Contractor fails to perform the work contracted.

**4. TERMINATION FOR CONVENIENCE.** The contract may be terminated at any time by the Government if it deems termination to be in its best interest, in which case the Contractor will be compensated for work performed and for reasonable termination costs.

**5. DISPUTES.** Any dispute concerning the funding agreement that cannot be resolved by agreement shall be decided by the Contracting Officer with right of appeal.

**6. EQUAL OPPORTUNITY.** The Awardee will not discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin.

**7. AFFIRMATIVE ACTION FOR VETERANS.** The Awardee will not discriminate against any employee or application for employment because he or she is a disabled veteran or veteran of the Vietnam era.

**8. AFFIRMATIVE ACTION FOR HANDICAPPED.** The Awardee will not discriminate against any employee or applicant for employment because he or she is physically or mentally handicapped.

**9. OFFICIALS NOT TO BENEFIT.** No Government official shall benefit personally from the contract.

**10. COVENANT AGAINST CONTINGENT FEES.** No person or agency has been employed to solicit or secure the contract upon an understanding for compensation except bonafide employees or commercial agencies maintained by the Contractor for the purpose of securing business.

**11. GRATUITIES.** The contract may be terminated by the Government if any gratuities have been offered to any representative of the Government to secure the contract.

**12. PATENT AND COPYRIGHT INFRINGEMENT.** The Contractor shall report each notice or claim of patent or copyright infringement based on the performance of the contract.

**13. AMERICAN MADE EQUIPMENT AND PRODUCTS.** When purchasing equipment or a product under the SBIR funding agreement, purchase only American-made items whenever possible.

## J. ADDITIONAL INFORMATION

1. The Program Solicitation is intended for informational purposes and reflects current planning. If there is any inconsistency between the information contained herein and the terms of any resulting SBIR funding agreement, the terms of the funding agreement are controlling.
2. Before award of an SBIR funding agreement, the Government may request the offeror to submit certain organizational, management, personnel, and financial information to assure responsibility of the offeror.
3. The Government is not responsible for any monies expended by the offeror before award of any funding agreement.
4. This Program Solicitation is not an offer by the Government and does not obligate the Government to make any specific number of awards. Also, awards under the SBIR program are contingent upon the availability of funds.
5. The SBIR program is not a substitute for existing unsolicited proposal mechanisms. Unsolicited proposals shall not be accepted under the SBIR program in either Phase I or Phase II.
6. If an award is made pursuant to a proposal submitted under this Program Solicitation, the Contractor will be required to certify that he or she has not previously been, nor is currently being, paid for essentially equivalent work by any agency of the Federal Government.
7. Notwithstanding the relatively broad definition of R/R&D in Section II, Definitions, hereof, awards under this solicitation are limited to APPLIED forms of research. Proposals that are surveys, including market, state-of-the-art, and/or literature surveys, which should have been performed by the offeror prior to the preparation of the proposal, or the preparation of allied questionnaires and instruction manuals, shall not be accepted. If such proposals are submitted, they shall be considered as not in compli-

ance with the solicitation intent, and therefore, technically unacceptable.

8. The requirement that the offeror designate a topic, and only one topic, (see page 1, Section I above) is also necessary. EPA receives hundreds of proposals each year and has special teams of reviewers for review of each research topic. In order to assure that proposals are evaluated by the correct team, it is the complete responsibility of the offeror to select and identify the best topic.

9. Instructions to Offerors - Competitive Acquisition (May 2001) FAR 52.215-1

(a) *Definitions (as used in this provision).*

“Discussions” are negotiations that occur after establishment of the competitive range that may, at the Contracting Officer’s discretion, result in the offeror being allowed to revise its proposal.

“In writing,” “writing,” or “written” means any worded or numbered expression that can be read, reproduced, and later communicated, and includes electronically transmitted and stored information.

“Proposal modification” is a change made to a proposal before the solicitation’s closing date and time, or made in response to an amendment, or made to correct a mistake at any time before award.

“Proposal revision” is a change to a proposal made after the solicitation closing date, at the request of or as allowed by a Contracting Officer as the result of negotiations.

“Time,” if stated as a number of days, is calculated using calendar days, unless otherwise specified, and will include Saturdays, Sundays, and legal holidays. However, if the last day falls on a Saturday, Sunday, or legal holiday, then the period shall include the next working day.

(b) *Amendments to solicitations.*

If this solicitation is amended, all terms and conditions that are not amended remain unchanged. Offerors shall acknowledge receipt of any amendment to this solicitation by the date and time specified in the amendment(s).

(c) *Submission, modification, revision, and withdrawal of proposals.*

(1) Unless other methods (e.g., electronic commerce or facsimile) are permitted in the solicitation, proposals and modifications to proposals shall be submitted in paper media in sealed envelopes or packages (i) addressed to the office specified in the solicitation, and (ii) showing the time and date specified for receipt, the solicitation number, and the name and address of the offeror. Offerors using commercial carriers should ensure that the proposal is marked on the outermost wrapper with the information in paragraphs (c)(1)(i) and (c)(1)(ii) of this provision.

(2) The first page of the proposal must show —

- (i) The solicitation number;
- (ii) The name, address, and telephone and facsimile numbers of the offeror (and electronic mail address if available);
- (iii) A statement specifying the extent of agreement with all terms, conditions, and provisions included in the solicitation and agreement to furnish any or all items upon which prices are offered at the price set opposite each item;
- (iv) Names, titles, and telephone and facsimile numbers (and electronic mail addresses if available) of persons authorized to negotiate on the offeror's behalf with the Government in connection with this solicitation; and
- (v) Name, title, and signature of person authorized to sign the proposal. Proposals signed by an agent shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

(3) Submission, modification, revision, and withdrawal of proposals.

- (i) Offerors are responsible for submitting proposals, and any modifications or revisions, so as to reach the Government office designated in the solicitation by the time specified in the solicitation. If no time is specified in the solicitation, the time for receipt is 4:30 p.m., local time, for the designated Government office on the date that proposal or revision is due.

(ii)(A) Any proposal, modification, or revision received at the Government office designated in the solicitation after the exact time specified for receipt of offers is "late" and will not be considered unless it is received before award is made, the Contracting Officer determines that accepting the late offer would not unduly delay the acquisition; and —

(1) If it was transmitted through an electronic commerce method authorized by the solicitation, it was received at the initial point of entry to the Government infrastructure not later than 5:00 p.m. one working day prior to the date specified for receipt of proposals; or

(2) There is acceptable evidence to establish that it was received at the Government installation designated for receipt of offers and was under the Government's control prior to the time set for receipt of offers; or

(3) It is the only proposal received.

(ii)(B) However, a late modification of an otherwise successful proposal that makes its terms more favorable to the Government, will be considered at any time it is received and may be accepted.

(iii) Acceptable evidence to establish the time of receipt at the Government installation includes the time/date stamp of that installation on the proposal wrapper, other documentary evidence of receipt maintained by the installation, or oral testimony or statements of Government personnel.

(iv) If an emergency or unanticipated event interrupts normal Government processes so that proposals cannot be received at the office designated for receipt of proposals by the exact time specified in the solicitation, and urgent Government requirements preclude amendment of the solicitation, the time specified for receipt of proposals will be deemed to be extended to the same time of day specified in the solicitation on the first work day on which normal Government processes resume.

(v) Proposals may be withdrawn by written notice received at any time before award.



Oral proposals in response to oral solicitations may be withdrawn orally. If the solicitation authorizes facsimile proposals, proposals may be withdrawn via facsimile received at any time before award, subject to the conditions specified in the provision at 52.215-5, Facsimile Proposals. Proposals may be withdrawn in person by an offeror or an authorized representative, if the identity of the person requesting withdrawal is established and the person signs a receipt for the proposal before award.

(4) Unless otherwise specified in the solicitation, the offeror may propose to provide any item or combination of items.

(5) Offerors shall submit proposals in response to this solicitation in English, unless otherwise permitted by the solicitation, and in U.S. dollars, unless the provision at FAR 52.225-17, Evaluation of Foreign Currency Offers, is included in the solicitation.

(6) Offerors may submit modifications to their proposals at any time before the solicitation closing date and time, and may submit modifications in response to an amendment, or to correct a mistake, at any time before award.

(7) Offerors may submit revised proposals only if requested or allowed by the Contracting Officer.

(8) Proposals may be withdrawn at any time before award. Withdrawals are effective upon receipt of notice by the Contracting Officer.

*(d) Offer expiration date.*

Proposals in response to this solicitation will be valid for the number of days specified on the solicitation cover sheet (unless a different period is proposed by the offeror).

*(e) Restriction on disclosure and use of data.*

Offerors that include in their proposals data that they do not want disclosed to the public for any purpose, or used by the Government except for evaluation purposes, shall —

(1) Mark the title page with the following legend: This proposal includes data that shall not be disclosed outside the Government and shall not be

duplicated, used, or disclosed—in whole or in part—for any purpose other than to evaluate this proposal. If, however, a contract is awarded to this offeror as a result of—or in connection with—the submission of these data, the Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting contract. This restriction does not limit the Government's right to use information contained in these data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets [insert numbers or other identification of sheets]; and

(2) Mark each sheet of data it wishes to restrict with the following legend: Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this proposal.

*(f) Contract award.*

(1) The Government intends to award a contract or contracts resulting from this solicitation to the responsible offeror(s) whose proposal(s) represents the best value after evaluation in accordance with the factors and subfactors in the solicitation.

(2) The Government may reject any or all proposals if such action is in the Government's interest.

(3) The Government may waive informalities and minor irregularities in proposals received.

(4) The Government intends to evaluate proposals and award a contract without discussions with offerors (except clarifications as described in FAR 15.306(a)). Therefore, the offeror's initial proposal should contain the offeror's best terms from a cost or price and technical standpoint. The Government reserves the right to conduct discussions if the Contracting Officer later determines them to be necessary. If the Contracting Officer determines that the number of proposals that would otherwise be in the competitive range exceeds the number at which an efficient competition can be conducted, the Contracting Officer may limit the number of proposals in the competitive range to the greatest number that will permit an efficient competition among the most highly rated proposals.

(5) The Government reserves the right to make an award on any item for a quantity less than the quantity offered, at the unit cost or prices offered, unless the offeror specifies otherwise in the proposal.

(6) The Government reserves the right to make multiple awards if, after considering the additional administrative costs, it is in the Government's best interest to do so.

(7) Exchanges with offerors after receipt of a proposal do not constitute a rejection or counteroffer by the Government.

(8) The Government may determine that a proposal is unacceptable if the prices proposed are materially unbalanced between line items or subline items. Unbalanced pricing exists when, despite an acceptable total evaluated price, the price of one or more contract line items is significantly overstated or understated as indicated by the application of cost or price analysis techniques. A proposal may be rejected if the Contracting Officer determines that the lack of balance poses an unacceptable risk to the Government.

(9) If a cost realism analysis is performed, cost realism may be considered by the source selection authority in evaluating performance or schedule risk.

(10) A written award or acceptance of proposal mailed or otherwise furnished to the successful offeror within the time specified in the proposal shall result in a binding contract without further action by either party.

(11) The Government may disclose the following information in postaward debriefings to other offerors:

- (i) The overall evaluated cost or price and technical rating of the successful offeror;
- (ii) The overall ranking of all offerors, when any ranking was developed by the Agency during source selection;
- (iii) A summary of the rationale for award; and
- (iv) For acquisitions of commercial items, the make and model of the item to be delivered by the successful offeror.

## VI. SUBMISSION OF PROPOSALS

A. Your proposal with an original and nine (9) copies shall be received at one of the following addresses by 12:00 p.m. (noon), local time, on March 21, 2002.

### U.S. MAIL ADDRESS:

U.S. Environmental Protection Agency  
Solicitation No. PR-NC-02-10153 - Mobile Sources SBIR  
Closing Date: March 21, 2002 at 12:00 p.m. (noon)  
Attention: Antonio Leathers, Mobile Sources SBIR  
RTP Procurement Operations Division (D143-01)  
Research Triangle Park, NC 27711

### HAND CARRIED/COURIER ADDRESS:

U.S. Environmental Protection Agency  
Solicitation No. PR-NC-02-10153 - Mobile Sources SBIR  
Closing Date: March 21, 2002 at 12:00 p.m. (noon)  
Attention: Antonio Leathers, Mobile Sources SBIR  
RTP Procurement Operations Division (D143-01)  
4930 Old Page Road  
Research Triangle Park, NC 27709

**IMPORTANT!!! Please note Section V, Paragraph J.9(c) concerning Late Proposals, Modifications of Proposals and Withdrawal of Proposals.**

**Telegraphic, telecopied, or facsimile proposals will NOT be considered for award.**

B. Please do not use special bindings or covers. Staple the pages in the upper left corner of the cover sheet of each proposal.

C. All copies of a proposal shall be sent in the same package.

D. The proposal should be self-contained and written with the care and thoughtfulness accorded papers for publication.

## VII. SCIENTIFIC AND TECHNICAL INFORMATION SOURCES

(See Appendix D)

## VIII. SBIR PHASE I MOBILE SOURCES RESEARCH TOPICS

*Program Scope:* The objective of this solicitation is to increase the incentive and opportunity for small firms to undertake cutting edge, high-risk, or long-term research that has a high potential payoff if the research is successful. Federal support of the front-end research on new ideas, often the highest risk part of the innovation process, may provide small businesses sufficient incentive to pursue such research.

EPA's SBIR program does not fund basic research or literature searches. It is recognized that any research and development project starts out as a concept of the inventor. Basic theoretic research studies and preliminary laboratory testing of the concept often are needed to develop an idea. Literature and other surveys and questionnaires also are needed to rule out duplication and inappropriate research study and process detail, finally leading to the process design of a prototype apparatus or process that could be tested to show the feasibility of the innovation. These basic research activities and preliminary studies should be completed before preparing an SBIR proposal.

Proposals only offering computer expert systems, computer models, and computer-aided design activities are unacceptable. Computer activities may be helpful tools in the early identification of pollution problems and possible solutions, but they do not directly reduce pollution. They cannot be used in lieu of applied laboratory research to determine the feasibility of a pollution control process. Also, proposals which only offer the performance of a design activity cannot be judged as it is impossible to guess what sort of apparatus or process will result. Without a straightforward description of the process and/or apparatus to be tested, there can be no determination of the scientific and technical quality of the work plan. Proposals only offering such design activities are unacceptable.

*Program Topics:* The proposed research must directly pertain to EPA's environmental mission and must be responsive to EPA program interests included in the topic descriptions of this solicitation. The research should be the basis for technological innovation resulting in new commercial products, processes, or services which benefit the public and promote the growth of the small business.

This special SBIR solicitation is focused on mobile source emission control including engine-related digital valve technology, diesel engine after-treatment, on-vehicle diesel fuel sulfur control, mobile sources monitoring technologies for air toxics and particulate matter mass, and on-vehicle emission measurement technologies.

The regular SBIR Phase I solicitation will cover nanomaterials and pollution prevention, drinking water and wastewater treatment, control of air pollution, solid and hazardous waste management, and environmental monitoring and analytical technologies. (The regular solicitation does not include topics covered in the storm-water/arsenic and mobile sources special solicitations.) The regular solicitation will open on March 28, 2002, and close on May 23, 2002.

Processes involving anthropogenic radioactive materials or the application of fertilizers are addressed by other agencies and are not included in this solicitation. Technologies that only involve fuel savings without direct environmental benefits, also are addressed by other agencies and are not included in this solicitation. Specific topics of this solicitation include:

### A. ENGINE-RELATED DIGITAL VALVE TECHNOLOGY

Digital and electronic control valve technologies can be used in engine applications that require fast, efficient, accurate, and precise fluid control. By using residual magnetism to hold a valve spool open or closed, electronic valve technologies only consume energy when a valve spool is shifted from one side to the other via electronic controls. Examples of engine-related electronic valve technologies include fuel injection and valve actuation systems. Electronically controlled and hydraulically actuated and intensified fuel injectors can generate very high injection pressures and multiple high precision injections, which are needed for future development of clean diesel engine technology and gasoline direct injection engine technology. Valve actuation systems for camless engine technology allow the cylinder valves to be operated independently for maximum performance. A camless engine with electronic control valves has significant potential to

improve fuel efficiency, power, and lower emissions by optimization of the in-cylinder combustion process.

## B. DIESEL ENGINE NO<sub>x</sub> AND PM AFTERTREATMENT TECHNOLOGY

Diesel engine NO<sub>x</sub> and PM aftertreatment technology can be used to control NO<sub>x</sub> and PM emissions from diesels to levels that meet EPA's most recent light duty vehicle rule and EPA's most recent on-highway heavy-duty diesel engine rule. EPA's Office of Transportation and Air Quality (OTAQ) has identified some promising aftertreatment technology, and has published its findings as part of the recent rules. Electronic versions of OTAQ's most recent technical review of these aftertreatment technologies can be downloaded from <http://www.epa.gov/otaq/diesel.htm>. Of particular relevance is "Chapter III: Emissions Standards Feasibility" of the Regulatory Impact Analysis (EPA420-R-00-026). EPA needs alternative aftertreatment technologies that meet or exceed the performance of the technologies cited in OTAQ's recent analysis.

## C. ON-VEHICLE DIESEL FUEL SULFUR CONTROL TECHNOLOGY

EPA has determined that the most promising NO<sub>x</sub> and PM aftertreatment technology currently will require fuel that contains less than 15 parts-per-million residual sulfur (ppm S by mass). Aftertreatment performance might be further enhanced by trapping the residual fuel sulfur with an additional aftertreatment component. Such an on-vehicle exhaust "sulfur trap" technology might be either regenerable or disposable over intervals of use that are similar to those of engine oil filters. Alternatively, aftertreatment performance also might be enhanced by the use of zero or near-zero sulfur fuel. One technique to achieve zero sulfur fuel involves removing the residual (15 ppm) sulfur from diesel fuel just prior to its use in an engine. Such an on-vehicle "fuel polisher" technology might be either regenerable or disposable over intervals of use that are similar to those of engine oil filters.

## D. ON-VEHICLE EMISSIONS MEASUREMENT TECHNOLOGY

EPA needs on-vehicle emissions data from on-highway and non-road vehicles, while the vehicles are operated in-use under real-world operation. To facilitate data collection, various miniature sensors are needed to measure cer-

tain parameters *insitu*. These parameters include concentrations of NO, NO<sub>2</sub>, N<sub>2</sub>O, SO<sub>2</sub>, NH<sub>4</sub>, CO, CO<sub>2</sub>, diesel and gasoline hydrocarbons, particulate matter mass, exhaust flow rate, fuel flow rate, engine and vehicle speed, and shaft torque. These rugged sensors must be non-intrusive, easily installed, low power, and fast response (i.e., faster than one second to indicate 90% of a full-scale step change), and they must be accurate and precise over the full range of vehicle operation. In addition to these parameters, a technique to sample a proportional amount of transient raw exhaust flow is needed for proper integrated sampling.

## E. MOBILE SOURCE AIR TOXICS MEASUREMENT TECHNOLOGY

In a recent action under 202(l) of the Clean Air Act, EPA identified 21 compounds as Mobile Source Air Toxics, and these are listed below. Diesel particulate matter is one (1) of the twenty-one (21). Five pollutants have been selected for initial attention in addition to diesel particulate matter. These are acrolein, acetaldehyde, formaldehyde, benzene, and 1,3-butadiene.

List of Mobile Source Air Toxics (MSATs)

Acetaldehyde	Diesel Particulate Matter + Diesel Exhaust Organic Gases	MTBE
Acrolein	Ethylbenzene	Naphthalene
Arsenic Compounds <sup>1</sup>	Formaldehyde	Nickel Compounds <sup>1</sup>
Benzene	n-Hexane	POM <sup>3</sup>
1,3-Butadiene	Lead Compounds <sup>1</sup>	Styrene
Chromium Compounds <sup>1</sup>	Manganese Compounds <sup>1</sup>	Toluene
Dioxin/Furans <sup>2</sup>	Mercury Compounds <sup>1</sup>	Xylene

<sup>1</sup> Although the different metal compounds generally differ in their toxicity, the on-road mobile source inventory contains emissions estimates for total metal compounds (i.e., the sum of all forms).

<sup>2</sup> This entry refers to two large groups of chlorinated compounds. In assessing their cancer risks, their quantitative potencies are usually derived from that of the most toxic, 2,3,7,8-tetrachlorodibenzodioxin.

<sup>3</sup> Polycyclic Organic Matter (POM) includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 degrees centigrade. A group of seven polynuclear aromatic hydrocarbons, which have been identified by EPA as probable human carcinogens, (benz (a) anthracene, benzo (b) fluoranthene, benzo (k) fluoranthene, benzo (a) pyrene, chrysene, 7,12-dimethylbenz (a) anthracene, and indeno (1,2,3-cd) pyrene) are used here as surrogates for the larger group of POM compounds.

EPA needs innovative measurement technology and methods for the quantification of these species in engine exhaust. The technology and methods may include, but are not limited to, integrated sample collection followed by sample extraction and analysis, real-time sampling and analysis, and on-vehicle sampling and/or on-vehicle real-time analysis techniques.

## **F. LOW CONCENTRATION PARTICULATE MATTER MASS MEASUREMENT TECHNOLOGY**

EPA needs innovative measurement technology for the quantification of low concentration particulate matter mass. OTAQ's most recent light-duty vehicle and heavy-duty diesel engine rules specified particulate matter mass emission limits of 0.01 g/mi and 0.01 g/bhp-hr over their respective test cycles. These are order-of-magnitude decreases in emissions limits compared to the current limits, and accurate and precise gravimetric quantification at these limits approaches the practical limits of EPA's current test procedure. Subsequently, EPA's most recent heavy-duty diesel engine rule specified revised procedures for the gravimetric analysis of these very low emissions quantities. The rule also specified a protocol for submitting alternative measurement procedures for EPA approval. Details of the revised test procedure and alternative measurement approval process can be downloaded from <http://www.epa.gov/otaq/diesel.htm>. Of particular relevance is the document entitled, "Regulations (signed December 21, 2000, published January 18, 2001)", and specifically within this document, sections "§ 86.1306-07 Equipment required and specifications; overview," and, "§ 86.1312-2007 Filter stabilization and microbalance workstation environmental conditions, microbalance specifications, and particulate matter filter handling and weighing procedures".

## **IX. SUBMISSION FORMS AND CERTIFICATIONS**

The attached forms, Appendix A - Proposal Cover Sheet, Appendix B - Project Summary, and Appendix C - SBIR Proposal Summary Budget, should be downloaded and printed from the Internet or photocopied, and completed as indicated under Section III, Proposal Preparation Instructions and Requirements. The purpose of these forms is to meet the mandate of law or regulation and simplify the submission of proposals.

**Appendix A**  
**PROPOSAL COVER SHEET**  
**U.S. Environmental Protection Agency,**  
**SMALL BUSINESS INNOVATION RESEARCH MOBILE SOURCES PHASE I**  
**SOLICITATION NO. PR-NC-02-10153**

PROPOSAL TITLE \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

FIRM NAME: \_\_\_\_\_  
\_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_  
\_\_\_\_\_

CITY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

AMOUNT REQUESTED:\$ \_\_\_\_\_ PROPOSED DURATION (PHASE I): 10 MOS  
(Not to Exceed \$100,000)

\*\*\*\*\*Proposals submitted in response to this solicitation will be valid for 300 days\*\*\*\*\*

TOPIC (check one)

- \_\_\_ A. Engine-Related Digital Valve Technology
- \_\_\_ B. Diesel Engine NO<sub>x</sub> and PM After-Treatment Technology
- \_\_\_ C. On-Vehicle Diesel Fuel Sulfur Control Technology
- \_\_\_ D. On-Vehicle Emission Measurement Technology
- \_\_\_ E. Mobile Source Air Toxics Measurement Technology
- \_\_\_ F. Low Concentration PM Mass Measurement Technology

CERTIFICATIONS AND AUTHORIZATIONS: Answer Y(Yes) or N(No)

- \_\_\_ 1. The above concern certifies that it is a small business concern and meets the definition as stated in the program solicitation.
- \_\_\_ 2. The above concern certifies that a minimum of 2/3 of the research and/or analytical effort will be performed by the proposing firm.
- \_\_\_ 3. If the proposal does not result in an award, is the Government permitted to disclose the title and technical abstract page of your proposed project, and the name, address, and telephone number of the official of the proposing firm to any inquiring parties?
- \_\_\_ 4. The above concern certifies that it is a woman owned small business concern and meets the definition as stated in the program solicitation.\*
- \_\_\_ 5. The above concern certifies that it is a socially and economically disadvantaged small business concern and meets the definition as stated in the program solicitation.\*
- \_\_\_ 6. Do you plan to send, or have you sent, this proposal or a similar one to any other federal agency? If yes, which? Use acronym(s) for each agency, (e.g., DOD, NIH, DOE, NASA, etc.) \_\_\_\_\_
- \_\_\_ 7. Choose one of the following to describe your Organization Type:  
    \_\_\_ Individual \_\_\_ Partnership \_\_\_ Corporation \_\_\_ LLC

\* For information purposes only.

\_\_\_\_ 8. Provide the following information: Tax Identification No: \_\_\_\_\_  
Dun & Bradstreet Number: \_\_\_\_\_  
Common Parent Name: \_\_\_\_\_

ENDORSEMENTS

Authorized Negotiator:	Person Authorized to Sign Proposal:
Print Name: _____	Print Name: _____
Title: _____	Title: _____
Telephone: _____	Telephone: _____
Fax: _____	Fax: _____
E-mail: _____	E-mail: _____
Signature: _____	Signature: _____
Date: _____	Date: _____

PROPRIETARY NOTICE: For any other purpose than to evaluate the proposal, these data shall not be disclosed outside the Government and shall not be duplicated, used or disclosed in whole or in part, provided that if a funding agreement is awarded to this offeror as a result of or in connection with the submission of these data the Government shall have the right to duplicate, use or disclose the data to the extent provided in the funding agreement. This restriction does not limit the Government's right to use information contained in the data if it is obtained from another source without restriction. The data in this proposal subject to this restriction are contained on pages \_\_\_\_\_ of this proposal.

**Appendix B**  
**U.S. ENVIRONMENTAL PROTECTION AGENCY**  
**SMALL BUSINESS INNOVATION RESEARCH PROGRAM**  
**SOLICITATION NUMBER PR-NC-02-10153**  
**MOBILE SOURCES - PHASE I**

**PROJECT SUMMARY (Limit to One Page)**

FIRM NAME, ADDRESS, TELEPHONE AND FAX NUMBER, AND E-MAIL ADDRESS:

Firm Name: \_\_\_\_\_ Telephone: \_\_\_\_\_

Address: \_\_\_\_\_ Fax: \_\_\_\_\_

\_\_\_\_\_ E-mail: \_\_\_\_\_

TITLE OF PROPOSAL: \_\_\_\_\_

\_\_\_\_\_

TOPIC LETTER AND DESCRIPTION: \_\_\_\_\_

NAME, TITLE AND E-MAIL ADDRESS OF PRINCIPAL INVESTIGATOR/PROJECT MANAGER: \_\_\_\_\_

\_\_\_\_\_

TECHNICAL ABSTRACT, RESULTS, AND POTENTIAL COMMERCIAL APPLICATION  
**(Limit to 400 Words; Must be Publishable):**



**Appendix C**  
**SBIR PROPOSAL SUMMARY BUDGET**  
(See Instructions on Reverse Side)

Organization and Address

A. DIRECT LABOR (PI and other staff, list separately) Hours/Est. Rate: \$

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

B. OVERHEAD:

C. OTHER DIRECT COSTS: (list separately) \$

\_\_\_\_\_  
\_\_\_\_\_

D. TRAVEL: List purpose and individuals and or title \$

\_\_\_\_\_  
\_\_\_\_\_

E. CONSULTANTS: (List Est. Rate and Hours) \$

\_\_\_\_\_  
\_\_\_\_\_

F. GENERAL AND ADMINISTRATIVE: \$

\_\_\_\_\_  
\_\_\_\_\_

**TOTAL COSTS (Total of A thru F above)** \$

G. PROFIT ( \_\_\_\_%) Not to exceed 10% of total project costs \$

**TOTAL PROJECT PRICE (Total costs + Profit)** \$

PRINT NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE SUBMITTED: \_\_\_\_\_

This proposal is submitted in response to EPA SBIR Special Phase I Solicitation No. PR-NC-02-10153 and reflects our best estimate as of this date.

### **INSTRUCTIONS FOR APPENDIX C**

The purpose of this form is to provide a vehicle whereby the offeror submits to the Government a pricing proposal of estimated costs with detailed information for each cost element, consistent with the offeror's cost accounting system.

If the completed summary is not self-explanatory and/or does not fully document and justify the amounts requested in each category, such documentation should be contained, as appropriate, on a budget explanation page immediately following the budget in the proposal. The form Appendix C will count as one page in the 25 page limit, and any budget explanation pages included will count separately toward the 25 page limit. (See below for discussion on various categories.)

A. Direct Labor - List individually all personnel included, the estimated hours to be expended and the rates of pay (salary, wages, and fringe benefits).

B. Overhead - Specify current rate(s) and base(s). Use current rate(s) negotiated with the cognizant federal negotiating agency, if available. If no rate(s) has (have) been negotiated, a reasonable rate(s) may be requested for Phase I which will be subject to approval by EPA. Offerors may use whatever number and types of overhead rates that are in accordance with their accounting systems and approved by the cognizant federal negotiating agency, if available.

C. Other Direct Costs - List all other direct costs which are not otherwise included in the categories described above, i.e., computer services, publication costs, subcontracts, etc. List each item of permanent equipment to be purchased, its price, and explain its relation to the project.

D. Travel - Address the type and extent of travel and its relation to the project.

E. Consultants - Indicate name, daily compensation, and estimated days of service.

F. General and Administrative (G&A) - Same as B. Above.

G. Profit - Reasonable fee (estimated profit) will be considered under this solicitation. For guidance purposes, the amount of profit normally should not exceed 10% of total project costs.

**Appendix D**  
**SCIENTIFIC AND TECHNICAL INFORMATION SOURCES**

State-of-the-art information, including service and cost details, useful in preparing SBIR proposals or in guiding research efforts may be obtained from the following sources:

National Technical Information Service (NTIS)  
5288 Port Royal Road  
Springfield, VA 22161  
(513) 569-7562

EPA Headquarters Library (3404)  
US Environmental Protection Agency  
401 M Street, SW  
Washington, DC 20460  
(202) 260-5922

The Hazardous Waste Collection and Database are available for use in the EPA Headquarters Library, the 10 EPA Regional libraries, EPA laboratories in Ada, OK; Edison, NJ; Las Vegas, NV; Research Triangle Park, NC and the National Enforcement Investigations Center in Denver, CO. The Database runs on an IBM AT/XT or compatible equipment and may be purchased from NTIS using the NTIS order number PB8-945000.

The Environmental Quality Instructional Resources Center  
1200 Chambers Road, R.310  
Columbus, OH 43212  
(614) 292-6717  
[Especially related to Drinking Water and Waste Water Treatment]

National Small Flows Clearinghouse (SWICH)  
P.O. Box 7219  
Silver Spring, MD 20910  
1-800-677-9424  
[Topic themes include source reduction, recycling, composting, waste combustion, collection, transfer, disposal, landfill gas, and special wastes]

ACCESS EPA (#055-000-00509-5) 1995 Edition

A consolidated guide to EPA information resources, services, and products. It provides access to:

- Public information tools
- Major EPA dockets
- Clearing houses and hot lines
- Records management programs
- Major EPA environmental database
- Library and information services
- State environmental libraries

“ACCESS EPA” may be ordered at a cost of \$16.00 each from the U.S. Government Printing Office, New Orders, Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954, or telephone (202)512-1800, or from NTIS using order number PB-147438.

Vendor Information System for Innovative Treatment Technologies (VISITT) Profiles 325 innovative technologies available from 204 vendors to treat ground water in situ, soil, sludges, and sediments. Includes technologies in all stages of development—bench, pilot, or full. VISITT is available at no charge on diskettes compatible with personal computers using DOS operating systems. To order VISITT diskettes and user manual, and to become a registered user, call the VISITT Hotline at 1-800-245-4505.

#### ENVIROSENSE

Internet: <http://www.epa.gov/envirosense>

ES includes numerous databases and addresses industry and small business needs by establishing specific compliance assistance, P2, regulatory and specific industry sector (SIC) data sets.

## Appendix E COMMERCIALIZATION FACTSHEET

(Finding Commercial Products; Conducting a Patent Search; Searching for Federal Research; Standards/Certifying Bodies)

### *FINDING COMMERCIAL PRODUCTS*

The technology you are proposing may already be being sold in the market. There are five web searches recommended as the minimum for determining if the technology is commercially available. In each case, when having trouble look for the FAQs (Frequently Asked Questions) or other advice on searching.

#### *Web Search using General Search Engines*

There are around 320 million indexed web pages and the web continues to grow exponentially. One problem with this rate of growth is that no single web search engine is capable of indexing the whole of cyberspace. We recommend using at least one meta-engine and two search engines.

A meta-engine is a search engine which searches other engines that actually catalog or index sites. Examples are Metacrawler <http://www.metacrawler.com/> and Dogpile <http://www.dogpile.com>. We use that search to identify which search engines seem to be producing the best results and then use those engines for more complicated queries which cannot be supported by metacrawler and other meta-engines.

Two engines for more detailed searches at present are Hotbot's More Options page ([http://www.hotbot.com/default.asp?MT=&SM=MC&DV=7&RG=.com&act.super+=More+Options+&DC=10&DE=2&\\_v=2&OPs=MDRTP](http://www.hotbot.com/default.asp?MT=&SM=MC&DV=7&RG=.com&act.super+=More+Options+&DC=10&DE=2&_v=2&OPs=MDRTP)) and Alta Vista's Advanced Query Page (<http://www.altavista.com/sites/search/adv>). Both engines allow you to search new groups (Usenet) as well as the Web. Hotbot has the largest number of pages indexed by any web browser as this is written. Alta Vista has the next most extensive coverage. Unfortunately, queries are constrained to the options presented. Alta Vista supports any Boolean query you can design. Both sites have a search by subject feature that provides another path to sites of interest. Because Digital Equipment Corporation, who maintains Alta Vista, is a high tech company, this engine has traditionally been strong on indexing science and technology sites.

When searching, expand or narrow your keywords over time. For example, when searching for "sapphire liquid crystal displays," you may want to broaden to liquid crystal displays or just displays. Also remember to use abbreviations such as LCD.

*Thomas Register of American Manufacturers:* Long a staple of corporate buyers and market researchers, you can access Thomas Register on-line for free at <http://www.thomasregister.com/>. Once you obtain your free membership, you can search the 155,000 companies by product. You may have to try a few different keywords to get hits.

*Hoovers :* Hoovers on-line at <http://www.hoovers.com> provides access to profiles on over 12,000 companies. These are the major firms in America, including subsidiaries of foreign operations. By using the keyword search, you can look for companies making products in areas related to your technology. Hoovers provides hypertext links to go to the company's web page. Phone, fax, and street address are also provided. If you cannot find the information on the web, ask for relevant product literature from their marketing departments.

*Press Releases:* PR Newswire (<http://www.prnewswire.com/>) redistributes corporate press releases. It provides coverage of newly released products that might not otherwise be found on the web.

*Patents:* We discuss patent searches in the next section of this FactSheet. Look for patents related to your technology, then examine the assignee field. Companies licensing or patenting technology in areas related to your technology are competitors that may be introducing products similar to the one you are considering proposing. Search for their web pages using one of the resources above.

## ***CONDUCTING A PATENT SEARCH***

*What is a patent?* A patent is a right to an invention that is granted by the U.S. Government or a foreign government. It gives the holder an exclusive right to use an invention during a period of time. In the United States, before a patent can be issued, the inventor must demonstrate his or her invention is new and non-obvious. To be new, an invention must not have been known nor made by others in the U.S. The invention also can not have been previously patented or presented in a publication prior to the claimed date on which the invention was made. Patents are handled by the U.S. Patent Office.

Non-obvious is established with reference to what would be obvious to a person of ordinary skill in the relevant technology (or technologies) at the time of the invention. A general rule is that the more complicated the technology and the greater the rate at which it is developing, the higher the skill-level of that hypothetical ordinary person. Non-obvious is determined by examining prior patents, technical publications, and non-secret work being conducted. Usually some aspect of an invention will be non-obvious and thus capable of being patented.

It is important to recognize that different rules apply in different countries. In the U.S., you have one year from the time of first disclosure, use, publication, or sale of an invention to patent the invention. Where more than one person or group makes a claim to be the inventor, the patent goes to the person or group that can demonstrate priority in time. Overseas, the rules are different. Usually the invention must be patented before any public disclosure, use, publication, or sale. In case of a dispute, priority goes to the first person or group to apply for a patent, regardless of who may actually be the inventor. You can, however, get the same overseas priority rights you would get from simultaneously filing overseas and in the U.S. if you file in each relevant country within 12 months of a U.S. patent application.

*How to search for U.S. patents:* To search the Patent Office go to <http://patents.uspto.gov/index.html>.

The Boolean search capability of the Patent Office enables constructing complicated searches to narrow in on patents of interest. It allows two terms Booleans in the first search, with more complicated queries when refining a search. You can search specific sets of years or the entire database. The advanced search gives you the ability to look in any or all of the fields in the patent—a very nice feature. Coverage includes all patents issued no later than one week earlier. It includes all utility, design, and plant patents since 1976. Claims and pictures are not included. (See below, Reading Patents.)

The IBM Patent server contains over 2 million patents. Where drawings are part of the patent, they have been scanned in and can be viewed. Off the home page, you have the option of searching from 1995 to present or 1971 to present. Hypertext links on the home page let you search by patent number, use Boolean Logic, or do a text search in various sections of the patent. Try to be as targeted as possible in your search terms. For example, “environmental monitor” will return 42 patents issued in 1995 or later on IBM’s server. “Mercury monitor,” by comparison, returns only three.

*Reading Patents:* Once you have found a patent that looks relevant for your interests, examine the abstract and the claims. The abstract provides an overview of what is covered. The claims give you the specific scope of the patent.

There are three paths for finding other patents of interest, once you have found the first one. The first method is to look at the class (or classes) of the patent. You can find patents addressing similar problems by looking in those classes. To fine tune the classes to use, look at a number of relevant patents. Examine the classes that are listed on the patent. Select those classes that most frequently appear across your sample of patents for further examination.

The second method is to look at the patents cited as references. The final method is to look at patents that reference the one you are examining. By searching text, relevant classes, and patents referred to or referencing relevant patents you can quickly determine if a U.S. patent has issued on a technology of interest. **CAUTION:** Examining U.S. patents does not assure you the technology has not been patented elsewhere. Further, if the patent is only applied for and has not yet been issued, you will not find it.

### ***SEARCHING FOR FEDERAL RESEARCH***

There are two sets of publicly available data on Federal Research. FEDRIP, or Federal Research in Progress, provides access to current civilian agency research. FEDRIP includes:

- Department of Agriculture
- Department of Energy
- Department of Veterans Affairs
- Environmental Protection Agency
- Federal Highway Administration
- National Institutes of Health
- NASA
- National Science Foundation
- US Geological Survey
- National Institute of Standards and Technology
- Nuclear Regulatory Commission
- Small Business Innovation Research

Parts of FEDRIP may be searched for free at The Community of Science, <http://fundedresearch.cos.com/>. Separate databases exist for the National Institutes of Health, NSF, USDA, and the SBIR program—which means you must do multiple searches. You can also search projects of the Medical Research Council of the United Kingdom. To search all of FEDRIP, go to <http://grc.ntis.gov/fedrip.htm>. There is a \$350 fee.

In addition, by going to an agency's Web site, you can find information on their current and/or past awards. The National Technical Information Service (NTIS) is the designated repository of research reports. It contains technical reports and other government-produced information products. The free access parts may be searched at <http://www.ntis.gov/>.

Perhaps the best comprehensive resource for searching is the RAND's RaDiUS at <http://www.rand.org/radius/>. RaDiUS, stands for "Research and Development in the United States." It is the first comprehensive database that tracks in real\_time the research and development activities and resources of the U.S. Government. Among its sources are the following: the Catalog of Federal Domestic Assistance (CFDA); USDA's Current Research Information System (CRIS); HHS's Computer Retrieval of Information on Scientific Projects (CRISP) and Information for Management, Planning, Analysis, and Coordination (IMPAC) system; DoD's R-1 and R-2 Budget Exhibits and Work Unit Information Summaries (WUIS); DOE's laboratory information system; the Federal Assistance Awards Data System (FAADS); the Federal Procurement Data System (FPDS); OMB's MAX system; DVA's R&D Information System (RDIS); NSF's Science and Technology System (STIS); and NASA's 507 System.

You must be a Government Contractor to subscribe to RaDiUS. The small business fee is \$1,000 per year per password.

### ***STANDARDS AND CERTIFYING BODIES***

If you are going to introduce a commercial product, it most likely will have to meet certain standards and be certified as meeting those standards. For example, we all are familiar with the Underwriter Laboratories seal found on household electrical products—a certification of safety under normal use.

A wide range of bodies creates standards or certifies products. To find relevant standards, we recommend beginning at the American National Standards Institute's "Internet Resources for Standards Developers", located at: <http://web.ansi.org/public/library/internet/resources.html>. The site provides links to U.S. bodies developing standards.

In the U.S., private sector laboratories, like UL commonly do certification. These organizations rely on standards developed by consensus bodies such as the American Society for Testing and Materials (<http://www.astm.org/>) or federal agencies such as EPA. ASTM maintains an International Directory of Testing Laboratories at: <http://www.astm.org/labs/index.html>. The Directory can be searched by geographic location, lab name, subject area, or keywords.

**IMPORTANT!!**

**IF YOU WISH TO RECEIVE AN ACKNOWLEDGMENT CARD TO CONFIRM RECEIPT OF YOUR PROPOSAL, PLEASE COMPLETE A STANDARD SELF-ADDRESSED POSTCARD CONTAINING THE FOLLOWING INFORMATION AND ATTACH TO THE ORIGINAL OF EACH PROPOSAL:**

Please type the following and fill in the blanks as appropriate:

This will acknowledge the receipt of your proposal titled:

---

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**Topic Letter \_\_\_\_.** The evaluation of proposals and the award of SBIR Contracts will require approximately 10 months, and no information on proposal status will be available until final selection(s) is made. Your proposal has been assigned EPA No. \_\_\_\_\_ (to be filled in by EPA).

**Date:** \_\_\_\_\_

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REVERSE SIDE: Please type the following in the upper left-hand corner (return address) and self-address the card to your corporate official. (Postcards that do not meet postal service standards will not be returned.)

---

U.S. EPA  
RTP/POD (D143-01)  
RTP, NC 27711

Official Business  
Penalty for Private Use \$300

Your Firm Name  
Address  
City, State Zipcode

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