COORDINATING RESEARCH COUNCIL, INC.
1 CONCOURSE PARKWAY, SUITE 800
ATLANTA, GA 30328
TEL: 678/795-0506 WWW.CRCAO.ORG

March 6, 2026

In reply, refer to:
CRC Project No. CM-136-18-4

Dear Prospective Bidder:

The Coordinating Research Council (CRC) invites you to submit a written proposal to provide services for "**Port Fuel Injection (PFI) Intake Valve Deposit (IVD) Test Development—LAC Passing Criteria Development**" (CRC Project No. CM-136-18-4). A description of the project is presented in Exhibit A, "Statement of Work."

Please indicate your intention to bid at THIS LINK on or before **March 24, 2026** if you or your organization intends to submit a written proposal for this research program. CRC will answer technical questions regarding the Request for Proposal if they are submitted in writing at least one week before the proposal submission deadline here: Q & A LINK. CRC will then return written answers to all of the bidders, along with a copy of the original questions. Questions submitted within a week of the deadline may not be answered before the proposal submission deadline.

A CRC technical group composed of industry representatives will evaluate your proposal. CRC reserves the right to accept or reject any or all proposals.

The reporting requirements will be monthly progress reports and a summary technical report at the end of the contractual period. The reporting requirements are described in more detail in the attachment entitled "Reports" (Exhibit B).

Key contract language examples are presented in Exhibits B, C, D, and E. CRC must adhere to standard contract language with minor adjustments only in extraordinary circumstances. **Failure to agree to these contract clauses as written may result in the project being awarded to another contractor.**

Important selection factors are listed in Exhibit G. CRC evaluation procedures require the technical group to complete a thorough technical evaluation before considering costs. After developing a recommendation based on technical considerations, the costs are revealed and the recommendation is modified as needed.

The proposal must be submitted as two separate documents. The technical approach to the problem will be described in part one, and a cost breakdown that is priced by task will be described in part two. The cost proposal document should include all costs associated with conducting the proposed program. The technical proposal should not be longer than 10 pages in length (not including resumes). **The schedule / timeline information must be included in the technical proposal; failure to do so may result in your proposal being set aside as non-responsive.**

CRC expects to negotiate a cost-plus fixed fee or cost reimbursement contract for the research program.

The technical and cost proposals should be submitted to:
Amber B. Leland Email: **aleland@crcao.org**

The deadline for receipt of your proposal is **April 10, 2026.**

EXHIBIT A

CRC Project Statement of Work

"Port Fuel Injection (PFI) Intake Valve Deposit (IVD) Test Development—LAC Passing Criteria Development"

CRC Project Number: CM-136-18-4

Background

The CRC Gasoline Deposit Group has developed a Port Fuel Injection (PFI) Intake Valve Deposit (IVD) test using the GM 2.4L LE9 engine platform. This program successfully established and validated a test cycle comparable to the ASTM D6201 method, demonstrating acceptable responsiveness to several commercially available detergents in current market fuels. By the conclusion of the study, the test showed deposit formation exceeding 200 mg/valve with base fuel, and less than 100 mg/valve when deposit control additives were applied at their TOP TIER treat rate.

Objective

The primary objective of this study is to establish passing criteria for the LE9-based IVD test that align with the BMW ASTM D5500 method, thereby enabling detergent certification for EPA Low Additive Concentration (LAC) performance in GM LE9. This effort will support EPA adoption of the previously developed LE9 test procedure by integrating newly defined LAC pass criteria using currently available IVD certification fuels. A secondary objective is to demonstrate enhanced performance at elevated additive treat rates. This secondary goal is optional and will be pursued based on budget availability and industry support.

Scope of Work

Identify currently available IVD certification fuels and additives approved for EPA LAC testing under ASTM D5500 or D6201 using those fuels.

Evaluate the performance of fuel-additive combinations at their LAC treat rates using the LE9 engine and optimize the treat rate for significant keep clean performance if needed.
Establish LAC passing criteria for EPA certification based on test results.

Test Plan

1. Collect IVD fuels currently available from specialty fuel suppliers
2. Collect additives with LAC treat rate with help of FATG
3. Select up to 5 pairs of additive and fuel combination and run in LE9 and Ford2.3 at its LAC treat rate
4. Select 4 pairs of additive and fuel combination for further **optimization** based on the results
5. Test the selected additive and fuel combination with optimized treat rate to achieve significant improvement in LE9
6. Determine the base fuel and LAC passing criteria in LE9

7. Select couple additive and fuel combinations at TOP TIER level for response at higher level (optional)
8. Report findings and engage with industry and regulatory stakeholders.

Deliverables

Additive performance near LAC treat rate in LE9 and comparison with historic D5500 or D6201 results

Recommended LAC passing criteria for the GM LE9 engine platform.

Key Words

PFI, IVD, LAC, certification fuel

References

CRC 676 - Port Fuel Injection (PFI) Intake Valve Deposit (IVD) Test Development -CRC Project No. CM-136-18-1 - Final Report

Draft Test Matrix

The number of tests is tabulated below and could be adjusted later depending on the cost of the testing and available budget:

	LE9 test	# tests	ASTM D6201	# tests	Test fuel (gallons)
Additive current LAC demo	3 base fuel + 5 keep clean	8	3 base fuel + 5 keep clean	8	3200
New LAC criteria determination	4 keep clean	4	4 keep clean	4	1600
Top Tier performance demo	2 keep clean	2		0	300
Total		14		12	5100

EXHIBIT B

REPORTS

A. CONTRACTOR shall submit a technical progress report covering work accomplished during each month of the contract performance. The report shall contain a description of overall progress, plus a separate description for each task or other logical segment of work on which effort was expended during the reporting period. Periodic conference calls may also be requested by CRC to update the technical committee overseeing the project.

B. CONTRACTOR shall submit to CRC a draft final report on or before DRAFT FINAL REPORT DUE DATE. The *Draft Final Report* shall be reviewed and returned to CONTRACTOR with comments no later than forty-five (45) days thereafter. The report shall document, in detail, all of the work performed under the contract including data, analyses, and interpretations, as well as recommendations and conclusions based upon results obtained. The report shall include tables, graphs, diagrams, curves, sketches, photographs, and drawings in sufficient detail to comprehensively explain the results achieved under the contract. The report shall be complete in itself and contain no reference, directly or indirectly, to the monthly progress reports and should be suitable for publication in the peer-review literature. Additional rounds of review may be required prior to acceptance of the Final Report. If applicable, data from the research shall be provided in a format suitable for releasing to the public along with the final report.

The draft report must have appropriate editorial review corrections made by the contractor prior to submission to CRC to avoid obvious formatting, grammar, and spelling errors. The report should be written in a formal technical style employing a format that best communicates the work conducted, results observed, and conclusions derived. Standard practice typically calls for a report structure that includes:

- CRC Title Page and Disclaimer Statement (both provided by CRC)
- Table of Contents
- List of Figures
- List of Tables
- List of Acronyms and Abbreviations
- Executive Summary
- Background
- Approach (including a full description of all experimental materials and methods)
- Results
- Conclusions (may also include Recommendations if CRC requests them)
- List of References
- Appendices as appropriate for the scope of the study.

Incomplete draft reports or reports of poor quality requiring additional outside editorial review may have outside editorial services charged back to the project budget.

EXHIBIT C

INTELLECTUAL PROPERTY RIGHTS

NOTE: This example language describes CRC's preferred approach to IP. There are alternative clauses to IP that can be used if necessary. All approaches require unlimited royalty-free access to any IP generated by CRC-funded research for CRC and its members.

Title to all inventions, improvements, and data, hereinafter, collectively referred to as ("Inventions"), whether or not patentable, resulting from the performance of work under this Agreement shall be assigned to CRC. CONTRACTOR shall promptly disclose to CRC any Invention which is made or conceived by CONTRACTOR, its employees, agents, or representatives, either alone or jointly with others, during the term of this agreement, which result from the performance of work under this agreement, or are a result of confidential information provided to CONTRACTOR by CRC or its Participants. CONTRACTOR agrees to assign to CRC the entire right, title, and interest in and to any and all such Inventions, and to execute and cause its employees or representatives to execute such documents as may be required to file applications and to obtain patents covering such Inventions in CRC's name or in the name of CRC's Participants or nominees. At CRC's expense, CONTRACTOR shall provide reasonable assistance to CRC or its designee in obtaining patents on such Inventions.

To the extent that a CRC member makes available any of its intellectual property (including but not limited to patents, patent applications, copyrighted material, trade secrets, or trademarks) to CONTRACTOR, CONTRACTOR shall have only a limited license to such intellectual property for the sole purpose of performing work pursuant to this Agreement and shall have no other right or license, express or implied, or by estoppel. To the extent a CRC member contributes materials, tangible items, or information for use in the project, CONTRACTOR acknowledges that it obtains only the right to use the materials, items, or information supplied for the purposes of performing the work provided for in this Agreement, and obtains no rights to copy, distribute, disclose, make, use, sell or offer to sell such materials or items outside of the performance of this Agreement.

EXHIBIT D

RELATIONSHIP OF PARTIES

It is agreed and understood that CONTRACTOR is acting as an independent contractor in the performance of any and all work hereunder, and to the extent caused by CONTRACTOR, CONTRACTOR shall be solely liable and responsible for the payment of all legal claims for damages made by its employees or agents, or by another person or persons, on account of any property damage or on account of personal injury sustained or suffered by, or on account of the death, of any person or persons, or on account of any other legal claims arising or growing out of CONTRACTOR's negligence in the performance of the agreement; and CONTRACTOR undertakes to indemnify CRC against any such liability.

EXHIBIT E

KEY PERSONNEL REQUIREMENTS

Certain skilled experienced professional and/or technical personnel are essential for successful performance by CONTRACTOR of its obligations and work under this Agreement. These personnel are persons whose resumes were submitted for evaluation of the Proposal and are identified by CRC as "Key Personnel". CRC awards contracts based on several requirements and the reputation and experience of Key Personnel are a significant requirement. CONTRACTOR agrees that CONTRACTOR will not remove or replace any Key Personnel from the contract work without compliance with paragraphs (a) and (b) hereof.

(a) If any Key Personnel for whatever reason becomes, or is expected to become, unavailable for work under this Agreement (or any specific Project) for a continuous period exceeding thirty (30) work days, or is not expected to perform the work hours and volume of work indicated in the proposal or initially anticipated, the CONTRACTOR shall immediately notify CRC and shall, subject to the concurrence of CRC, promptly replace such Key Personnel with personnel of at least substantially equal ability and qualifications acceptable to CRC.

(b) All requests for approval of substitutions of Key Personnel hereunder must be in writing to CRC and provide a detailed explanation of the circumstances necessitating the proposed substitutions. Requests for substitution must contain a complete resume for the proposed substitute Key Personnel, and any other information requested by CRC needed to approve or disapprove the proposed substitution. CRC will evaluate such requests and notify CONTRACTOR of approval or disapproval thereof in writing. CRC is not responsible for, and shall not be charged, any fees or other costs related to such replacement Key Personnel's performance of the services until the replacement Key Consultant has obtained the same proficiency and knowledge regarding the services as the former Key Personnel.

(c) If CRC determines that suitable and timely replacement of Key Personnel who have been reassigned, terminated or have otherwise become unavailable for the contract work is not reasonably forthcoming or that the proposed replacement Key Personnel would impair the successful completion of the contract or the services ordered, at the option of CRC, (i) the Agreement (in whole or in part related to the applicable contract work) may be terminated by CRC or (ii) the contract price or fixed fee may be equitably adjusted downward to compensate CRC for any resultant delay, loss, or damage, in an amount acceptable to CRC

EXHIBIT F

CRC POLICIES

It is understood that CONTRACTORS agree to follow CRC policies and procedures, including meeting attendance, project participation, and Anti-trust policies. A copy of these policies can be made available upon request.

It is understood that the major purpose of the work performed by CONTRACTOR is to obtain information that may be made available to industry and the public through publications or otherwise. Any announcement or publication of work under this agreement by CONTRACTOR shall be subject to review and approval by CRC and its committee members and shall recognize and give credit in the text and on the title pages to the cooperation of the CRC. This applies (but is not limited to) conference presentations, journal articles, and social media posts.

EXHIBIT G

PROPOSAL EVALUATION CRITERIA

1) Merits of proposed technical approach.
2) Previous performance on related research studies.
3) Personnel available for proposed study – related experience.
4) Timeliness of study completion.
5) Cost.