

## **NTRD Program Disclaimers**

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**Texas Commission on Environmental Quality  
New Technology Research & Development (NTRD) Program  
Monthly Project Status Report**

Contract Number: 582-5-70807-0002

Grantee: County of El Paso

Date Submitted: 11-02-05

Report for the **Monthly** period:

Starting Date 10-01-05 Ending Date 10-31-05

**Section I. Accomplishments** *(Please provide a bulleted list of project accomplishments as well as a description of their importance to the project.)*

To date, El Paso County, Ruby Mountain Inc., the Idaho National Lab, and Border Quality Campaign of El Paso del Norte have been coordinating with industry and local service providers in El Paso on the development of the natural gas shuttle bus for El Paso County. This has included the following:

- ARBOC regarding manufacture of the bus.
- John Deere, Bell Power Systems (Cummins) and Emissions Solutions about the feasibility of integrating engines into the International chassis. This includes details regarding the wiring harness, physical size of the engine and transmission and emissions certifications issues.
- Enviromech on the supply of the CNG tanks for the project vehicle.

Much of the work performed during October focused on making a final engine selection for the project vehicle. With regard to the two engines being considered, the following actions were undertaken:

Regarding the Cummins 5.9L Natural Gas Engine:

- Visited conversion facilities in Connecticut to assess capacity to complete the necessary engine conversion and installation of the CNG and LNG tanks as well as the integration of the economizer valve.
- Developed a final scope of work with the INL to complete the required modifications to the economizer valve.
- Worked with vehicle manufacturer to determine if the 5.9 was fully compatible with the 3200 International cab and chassis and if all the proposed CNG and LNG tanks could fit with the new engine while providing sufficient space for the HLA installation to occur next year.
- Made final determination on where the CNG and LNG tanks would be installed. It was determined that having Bell Power System conduct all the gas related changes would assure proper integration of the engine and fuel system.
- Established a production timetable for the conversion of the vehicle and its transport to El Paso, currently projected to be March 1, 2006.

Regarding the NaviStar DT466 Natural Gas Engine developed by Emissions Solutions:

- Reviewed system component layouts from supplier of natural gas engine to facilitate system configuration and layout for bus integration. Reviewed communications protocol for new model bus system integration.
- Coordinated schedules on when EPA certification will be applicable and at what emission levels will be recognized.
- Researched and reviewed Texas Railroad Commission rules recognized and exceptions that are unique and/or different than NFPA 52 & 57 as it relates to natural gas tank installations on the project vehicle.
- Reviewed and discussed status of EPA certification delays due to questions related to onboard diagnostic system with natural gas engine programs and emission controls failure.
- Reported status and changes to EPA certification to project team.
- Conducted logistical meetings with engine supplier on potential locations and requirements for installation of natural gas engine and accompanying fuel storage equipment.

**Indicate which part of the Grant Activities as defined in the grant agreement, the above accomplishments are related to:**

Task 1: Engineering Design and Packaging

## Section II: Problems/Solutions

<p><b>Problem(s) Identified</b></p> <p><i>(Please report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project)</i></p>	<p>As stated previously, integrating the John Deere Model 6081 natural gas engine into the International Tractor caused two primary concerns:</p> <ol style="list-style-type: none"><li>1) The first concern dealt with the physical dimensions of the Deere Engine and that it may not physically fit into the engine cavity of the International Tractor; and,</li><li>2) The second primary concern being the operating temperature of the Deere Model 6081 Natural Gas Engine. The Deere engine burns extremely hot and works very well on a rear-mount vehicle, but when the same engine is deployed in a front-mount vehicle, heat (and getting a sufficient radiator to vent that heat) becomes a concern.</li></ol>
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<p><b>Proposed Solution(s)</b></p> <p><i>(Please report any possible solution(s) to the problem(s) that were considered/encountered)</i></p>	<p>The project team has determined that the John Deere Model 6081 and the International Tractor are not compatible (in terms of physical dimensions). Subsequently, the project team continued exploring alternatives to the Deere engine, including examination of engine size, availability and maintainability. The engine technologies researched included: Cummins 5.9L natural gas engine; International 365 natural gas engine; and the Navistar DT466 natural gas engine. The International engine was immediately ruled out and a decision was made to rank the remaining two engines as follows: 1) Navistar DT466 natural gas engine and 2) Cummins 5.9L natural gas engine.</p>
<p><b>Action(s) Conducted and Results</b></p> <p><i>(Please describe the action(s) taken to resolve the problem(s) and its effect)</i></p>	<p>The Cummins engine was selected primarily because it fits the engine cavity of the vehicle. Other factors relevant to the selection were the history of the natural gas engine in transit applications as well as the availability of engine warranty and service opportunities in the El Paso area. Finally, it was determined that it was better to move forward with an engine and a company for which there was a track record and for which a wiring harness had all ready been developed by Bell Power Systems in Connecticut.</p>

**Section III. Goals and Issues for Succeeding Period:** *(Please provide a brief description of the goal(s) you hope to realize in the coming period and identify any notable challenges that can be foreseen)*

**Work in the next month of the project period will focus on the following contract tasks:**

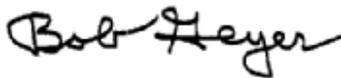
Task 1: Engineering Design and Packaging

2.1 Task Statement: Engineering design and packaging to integrate the HLA and LNG engine to the ADA transit bus chassis. Will submit the design to TCEQ for approval prior to installation and fabrication described under Task 2.

2.1.1. Engineering and design and packaging to integrate the HLA and LNG engine to the ADA transit bus chassis.

- 2.1.1.1. Package HLA in low floor rear drive chassis.
- 2.1.1.2. Design/detail required parts sufficient for fabrication.

In November, the project team will continue receiving different components of the bus ordered and the process of fabrication commenced. A project plan based on the engine selection will be developed and corresponding responsibilities defined. Additional work will be performed on the coordination of the LNG and CNG fuel supply systems. The economizer valve will further be tested and evaluated. Additionally, public relations & outreach activities will fully commence.



Date: \_\_\_\_\_ 11/7/05 \_\_\_\_\_

*Authorized Project Representative's Signature*

**NOTE:** *Please attach any additional information that you feel should be a part of your report or that may be required to meet the deliverable requirements for tasks completed during this reporting period.*