

NTRD Program Disclaimers

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

Received

AUG 22 2005

Contract Number: 592-5-70807-0004

Grantee: Baytech Corporation

Date Submitted: 16 August 2005

Implementation Grants Section

Report for the **Monthly** period:

Starting Date: 1 July 2005

Ending Date: 31 July 2005

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

1) Baytech received California Air Resources Board Executive Orders for the dedicated CNG and Propane California Medium duty (less than 14,000 GVW) cab and chassis. These are CARB certified at the Super Ultra-Low Emission Vehicle (SULEV) emissions level. The CARB Executive Orders chart below has been updated to reflect receipt of these Executive Orders.

CARB Executive Orders

Baytech Engine Family (Fuel)	Executive Order No.	Service class	NOx test level (g/bhp-hr)	End-of-life cert level -- NMHC+NOx (g/bhp-hr)	Status
5BYTH08.1C11 (Natural Gas)	A-330-0121	CA medium duty	0.23	0.3	Complete
5BYTH08.1P11 (propane)	A-330-0122	CA medium duty	0.21	0.4	Complete
6BYTH08.1C13 (CNG)	A-330-0126	HDO	0.23	0.3	Complete
6BYTH08.1P13 (propane)	A-330-0129	HDO	0.21	0.3	Complete
6BYTH08.1C23 (CNG or gasoline)		HDO	0.23	0.3	In-process
6BYTH08.1P23 (propane or gasoline)		HDO	0.21	0.4	In-process
6BYT08.1C12 (natural gas)	A-330-0139	HDO	0.21	0.5	Complete
6BYT08.1C22 (CNG or gasoline)		HDO	0.21	0.5	In-process
6BYTH08.1P12 (propane)	A-330-0140	HDO	0.25	0.9	Complete
6BYT08.1P22 (propane or gasoline)		HDO	0.25	0.9	In-process

- 2) Baytech continued corresponding with CARB regarding pending certification applications.
- 3) Baytech specified the propane vapor filter element and enclosure to be used on the 8.1L and 6.0L propane engines. These will be produced exclusively for Baytech.
- 4) Baytech installed and evaluated a new dashboard fuel gauge driver for dedicated CNG and propane applications and determined that it is ready for production.
- 5) Baytech continued commercialization of the 8.1L Heavy Duty propane and CNG engine. Baytech attended the annual Texas Propane Gas Association trade show in San Antonio, TX.

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

Items 1 and 2 are related to the activities in SOW Task 2 for the 8.1L propane and CNG engines.
 Items 3 and 4 are related to the activities in SOW Tasks 1 and 3 for the 8.1L and 6.0L propane and CNG engines.
 Item 5 is related to commercialization of the 8.1L propane and CNG heavy duty engines funded in part by this grant.

Section II: Problems/Solutions

<p>Problem(s) Identified</p> <p><i>(Please report anticipated or unanticipated problem(s) encountered and its effect on the progress of the project)</i></p>	<p>No problems are anticipated that will affect progress toward successful completion of the project.</p>
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Proposed Solution(s)

(Please report any possible solution(s) to the problem(s) that were considered/encountered)

Action(s) Conducted and Results

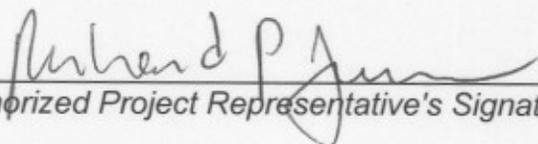
(Please describe the action(s) taken to resolve the problem(s) and its effect)

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)*

Baytech anticipates receiving the remaining pending CARB Executive Orders in August 2005.

Baytech will continue to market the propane and CNG 8.1L engine as part of our commercialization efforts. Baytech has received orders for both propane and CNG versions of the engine.

Baytech currently plans to conduct the 6.0L Heavy Duty propane engine prototype evaluation and testing beginning in September 2005. This work will be conducted using a 2006 Model Year vehicle/engine. Preliminary preparations and hardware component evaluation are underway.



Authorized Project Representative's Signature

Date: 8/16/05

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.*

The following documents are attached:

1) Copies of California Air Resources Board Executive Orders for the 8.1L propane and CNG received in July 2005 are attached.



BAYTECH CORPORATION

EXECUTIVE ORDER A-330-0122
New Engines for Diesel or Incomplete
Medium-Duty Vehicles

Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-45-9;

IT IS ORDERED AND RESOLVED: The engine and emission control systems produced by the manufacturer are certified as described below for use in diesel or incomplete medium-duty vehicles with a manufacturer's GVWR from 8501 to 14000 pounds. Production engines shall be in all material respects the same as those for which certification is granted.

MODEL YEAR	ENGINE FAMILY	EMISSION STD CATEGORY ²	FUEL TYPE ¹	STANDARDS & TEST PROCEDURE	ENGINE SIZES (L)	ECS & SPECIAL FEATURES ³	OBD COMPLIANCE	
2005	5BYTH08.1P11	SULEV	LPG	Otto	8.1	2TWC, 2HO2S(2), SFI	OBD(\$)	
ENGINE MODELS / CODES (rated power, in hp)							ENGINE (L)	OBD COMPLIANCE
L18 / 50 (332), L18 / 60 (332)							8.1	OBD(\$)

¹ -not applicable; GVWR=gross vehicle weight rating; 13 CCR xyz=Title 13, California Code of Regulations, Section xyz; 40 CFR 86.abc=Title 40, Code of Federal Regulations, Section 86.abc; L=liter; hp=horsepower; kw=kilowatt;
² CNG/LNG=compressed/liquefied natural gas; LPG=liquefied petroleum gas; E85=85% ethanol fuel; MF=multi fuel a.k.a BF=bl fuel; DF=dual fuel; FF=flexible fuel;
³ SULEV / ULEV / LEV=super ultra / ultra / low emission vehicle;
⁴ ECS=emission control system; TWC/O=C=three-way/oxidizing catalyst; WU (prefix)=warm-up catalyst; DPF=diesel particulate filter; HO2S/O2S=heated/oxygen sensor; HAFS/AFS=heated/air-fuel-ratio sensor (a.k.a., universal or linear oxygen sensor); TBI=throttle body fuel injection; SF/MFI=sequential/multi port fuel injection; DGI=direct gasoline injection; GCARB=gaseous carburetor; IDI/DDI=indirect/direct diesel injection; TC/SC=turbo/super charger; CAC=charge air cooler; EGR=exhaust gas recirculation; PAIR/AIR=pulsed/secondary air injection; SPL=smoke puff limiter; OBD(I) / (P) / (\$)=full / partial / partial with a line / on-board diagnostic; ECM/PCM=engine/powertrain control module; EM=engine modification; 2 (prefix)=parallel; (2) (suffix)=in series;

Following are: 1) the FTP exhaust emission standards or family emission limit(s) as applicable under 13 CCR 1956.8; 2) the EURO and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/bhp-hr, for this engine family. "Diesel" CO, EURO and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For dual- and flexible-fueled engines, the CERT values in brackets [] are those when tested on conventional test fuel.)⁴

	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	*	*	*	*	0.5	*	7.2	*	*	*	0.025	*
FEL	*	*	*	*	*	*	*	*	*	*	*	*
CERT	*	*	*	*	0.4	*	4.1	*	*	*	0.001	*
NTE	*	*	*	*	*	*	*	*	*	*	*	*

⁴ g/bhp-hr=grams per brake horsepower-hour; FTP=Federal Test Procedure; EURO=Euro III European Steady-State Cycle; NTE=Not-to-Exceed emission limit; STD=standard or emission test cap; FEL=family emission limit; CERT=certification level; NMHC/HC=non-methanehydrocarbon; NOx=oxides of nitrogen; CO=carbon monoxide; PM=particulate matter; HCHO=formaldehyde;

BE IT FURTHER RESOLVED: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: The listed engine models have been certified to the optional emission standards and test procedures in 13 CCR 1956.8 applicable to diesel or incomplete medium-duty vehicles with a GVWR from 8501 to 14000 pounds and, therefore, shall be subject to 13 CCR 2139(c) (in-use testing of engines certified for use in diesel or incomplete medium-duty vehicles with a 8501-14000 pound GVWR).

BE IT FURTHER RESOLVED: For the listed engine models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels), 13 CCR 1968.2 (on-board diagnostic, full or partial compliance), and 13 CCR 2035 et seq. (emission control warranty).

BE IT FURTHER RESOLVED: That the listed engine models are conditionally certified in accordance with 13 CCR Section 1968.2(i)(3) (on-board diagnostic, deficiencies) because the on-board diagnostic II system of the listed engine models has been determined to have four deficiencies. The listed engine models are approved subject to the manufacturer paying a fine of one hundred dollars (\$100) per engine for the third and fourth deficiencies in the listed engine family that is produced and delivered for sale in California.

On a quarterly basis, the manufacturer shall submit to the Air Resources Board reports of the number of engines produced and delivered for sale in California and pay the full fine owed for that quarter pursuant to this conditional certification. Payment shall be made payable to the State Treasurer for deposit in the Air Pollution Control Fund no later than thirty (30) days after the end of each calendar quarter during the 2005 model-year production period. Failure to pay the quarterly fine, in full, in the time provided, may be cause for the Executive Officer to rescind this conditional certification, effective from the start of the quarter in question, in which case all engines covered under this conditional certification for that quarter and all future quarters would be deemed uncertified and subject to a civil penalty of up to \$5000 per vehicle pursuant to Health and Safety Code Section 43154.

Engines certified under this Executive Order must conform to all applicable California emission regulations. The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed at El Monte, California on this 19TH day of July 2005.

Allen Lyons
Allen Lyons, Chief
Mobile Source Operations Division

 AIR RESOURCES BOARD	BAYTECH CORPORATION	EXECUTIVE ORDER A-330-0121 New Diesel or Incomplete Medium-Duty Vehicles Using Certified Engines
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Pursuant to the authority vested in the Air Resources Board by Health and Safety Code Division 26, Part 5, Chapter 2; and pursuant to the authority vested in the undersigned by Health and Safety Code Sections 39515 and 39516 and Executive Order G-02-003;

IT IS ORDERED AND RESOLVED: The following diesel or incomplete medium-duty vehicles (MDV) with a manufacturer's GVWR from 8501 to 14000 pounds are certified as described below. Production vehicles shall be in all material respects the same as those for which certification is granted.

ENGINE DESCRIPTION								
MODEL YEAR	ENGINE FAMILY	ENGINE MANUFACTURER	EMISSION STD CATEGORY ²	FUEL TYPE ¹	STANDARDS & TEST PROCEDURE	ENGINE SIZES (L)	ECS & SPECIAL FEATURES ³	EF OBD
	5BYTH08.1C11			CNG				
2005	EXECUTIVE ORDER A-330-0120	Baytech Corporation	SULEV		Otto	8.1	2TWC, 2HO2S(2), SFI	OBD(\$)
Gasoline, LPG or Alcohol Vehicles Only				VEHICLE DESCRIPTION				
EVAPORATIVE		FUEL TANK CAPACITY (gallons)	VEHICLE MODEL YEAR	VEHICLE MAKE & MODELS	VEH. OBD	ENGINE (L)	ENGINE MODELS / CODES (rated power, in hp)	ENG. OBD
FAMILY	UL (K)							
*	*	*	2005	CK20 Chevrolet: Silverado 2500, Silverado 2500HD CK20 GMC: Sierra 2500, Sierra 2500HD	OBD(\$)	8.1	L18 / 50 (283), L18 / 60 (283)	OBD(\$)
*	*	*	2005	CK30 Chevrolet: Silverado 3500, Silverado 3500 Cab Chassis CK30 GMC: Sierra 3500, Sierra 3500 Cab Chassis	OBD(\$)	8.1	L18 / 50 (283), L18 / 60 (283)	OBD(\$)

* not applicable; GVWR=gross vehicle weight rating; 13 CCR xyz=Title 13, California Code of Regulations, Section xyz; 40 CFR 86.abc=Title 40, Code of Federal Regulations, Section 86.abc; L=liter; hp=horsepower; kw=kilowatt; EF=engine family;
¹ CNG/LNG=compressed/liquefied natural gas; LPG=liquefied petroleum gas; E85=85% ethanol fuel; MF=multi fuel a.k.a BF=bi fuel; DF=dual fuel; FF=flexible fuel;
² SULEV / ULEV / LEV=super ultra / ultra / low emission vehicle;
³ ECS=emission control system; TWC/O2C=three-way/oxidizing catalyst; WU (prefix) =warm-up catalyst; DPF=diesel particulate filter; HO2S/O2S=heated/oxygen sensor; HAFS/AFS=heated/air-fuel-ratio sensor (a.k.a., universal or linear oxygen sensor); TBI=throttle body fuel injection; SF/MPF=sequential/multi port fuel injection; DGI=direct gasoline injection; GCARB=gaseous carburetor; IDI/DDI=indirect/direct diesel injection; TG/SC=turbo/super charger; CAC=charge air cooler; EGR=exhaust gas recirculation; PAIR/AIR=pulsed/secondary air injection; SPL=smoke puff limiter; OBD(F) / (P) / (S)=full / partial / partial with a line / on-board diagnostic; ECM/PCM=engine/powertrain control module; EM=engine modification; 2 (prefix)=parallel; (2) (suffix)=n series;

Following are: 1) the FTP exhaust emission standards or family emission limit(s) as applicable under 13 CCR 1956.8; 2) the EURO and NTE limits under the applicable California exhaust emission standards and test procedures for heavy-duty diesel engines and vehicles (Test Procedures); and 3) the corresponding certification levels, in g/bhp-hr, for this engine family. "Diesel" CO, EURO and NTE certification compliance may have been demonstrated by the manufacturer as provided under the applicable Test Procedures in lieu of testing. (For dual- and flexible-fuel, the CERT values in brackets [] are those when tested on conventional test fuel.)⁴

	NMHC		NOx		NMHC+NOx		CO		PM		HCHO	
	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO	FTP	EURO
STD	*	*	*	*	0.5	*	7.2	*	*	*	0.025	*
FEL	*	*	*	*	*	*	*	*	*	*	*	*
CERT	*	*	*	*	0.3	*	2.1	*	*	*	0.001	*
NTE	*	*	*	*	*	*	*	*	*	*	*	*

⁴ g/bhp-hr=grams per brake horsepower-hour; FTP=Federal Test Procedure; EURO=Euro III European Steady-State Cycle; NTE=Not-to-Exceed emission limit; STD=standard or emission test cap; FEL=family emission limit; CERT=certification level; NMHC/HC=non-methane/hydrocarbon; NOx=oxides of nitrogen; CO=carbon monoxide; PM=particulate matter; HCHO=formaldehyde;

BE IT FURTHER RESOLVED: Certification to the FEL(s) listed above, as applicable, is subject to the following terms, limitations and conditions. The FEL(s) is the emission level declared by the manufacturer and serves in lieu of an emission standard for certification purposes in any averaging, banking, or trading (ABT) programs. It will be used for determining compliance of any engine in this family and compliance with such ABT programs.

BE IT FURTHER RESOLVED: The listed engine models have been certified to the optional emission standards and test procedures in 13 CCR 1956.8 applicable to diesel or incomplete MDV with a 8501-14000 pound GVWR and shall be subject to 13 CCR 2139(c) (in-use testing of engines certified for use in diesel or incomplete MDV with a 8501-14000 pound GVWR).

BE IT FURTHER RESOLVED: For the listed vehicle models the manufacturer has submitted the materials to demonstrate certification compliance with 13 CCR 1965 (emission control labels), 13 CCR 1968.2 (on-board diagnostic, full or partial compliance), 13 CCR 1976(b)(1)(B)-(C) or 13 CCR 1976(b)(1)(F) (evaporative emission standards), 13 CCR 2035 et seq. (emission control warranty), and 13 CCR 2235 (fill pipes and openings of motor vehicle fuel tanks). (The braces {} are for gasoline, LPG or alcohol fueled vehicles only. The brackets [] are for gasoline or alcohol fueled vehicles only.)

Vehicles certified under this Executive Order shall conform to all applicable California emission regulations. The Bureau of Automotive Repair will be notified by copy of this Executive Order.

Executed at El Monte, California on this 19TH day of July 2005.


 Allen Lyons, Chief
 Mobile Source Operations Division