APPENDIX C

SOLID WASTE COLLECTION COMPANY SURVEY

I. Solid Waste Collection Company Survey

Staff interviewed 27 companies and public agencies that collect solid waste in the South Coast Air Quality Management District (SCAQMD). The private companies and municipal fleets surveyed (Table 1) account for approximately 4,300 solid waste collection vehicles or approximately 85 percent of the waste collection vehicles in the South Coast District.

Table 1. Private Companies and Municipalities Surveyed

Private Companies	Municipalities
Athens Services Big Bear Disposal Browning Ferris Industries Burrtec Waste Industries Cal Met Services Calif. Waste Services Commercial Waste Services Consolidated Disposal Service CR&R (four fleets) Foothill Waste Reclamation G&B Rubbish & Rolloff Palm Springs Disposal Key Disposal Rainbow Disposal Waste Management (11 fleets)	Burbank Culver City Glendale Long Beach Los Angeles DGS Ontario Pasadena Pomona Redlands San Bernardino (city) Santa Monica Torrance

Of the 27 entities interviewed, 15 are currently using alternative-fuel vehicles, including dual-fuel, which run on a combination of diesel and alternative fuel. The other 12 have only vehicles that run on standard CARB diesel or ultra low sulfur diesel. While ARB staff visited as many hauling facilities as possible for face-to-face interviews, some survey forms were completed as the result of telephone calls or returned by e-mail. In some cases, the initial survey results were supplemented by follow-up telephone calls, site visits or e-mails.

Questions 1 through 4 were designed to elicit specific information on the number of collection vehicles in the fleet, the number of diesel and alternative fuel vehicles, how long various fuels had been used, and whether the ability existed to re-fuel trucks in the

field. Questions 5 through 9 dealt with issues of maintenance and maintenance facilities for alternative fuel vehicles and additional staff training that might be needed to deal with maintenance of these vehicles. Question 10 was open-ended, asking for any additional comments the respondent wanted to make in connection with topics mentioned or not mentioned in the survey.

A. Survey Results

Private waste hauling companies and municipalities that do their own waste collection rely mainly on three types of fuels, diesel, compressed natural gas (CNG), and liquefied natural gas (LNG) to power their collection vehicles.

1. Fuel Usage

Diesel is the fuel with which virtually all haulers have the longest experience and greatest comfort level. Conversely, for most individuals in the hauling industry, experience with alternative fuels is relatively new and they have not reached the comfort level for these fuels that they have with diesel. Of those surveyed, 15 listed experience with alternative fuels ranging from six months to 10 years. The majority, however, listed three years or less experience with alternative fuels. Even with the District's Rule 1193 having been in effect for nearly three years, 12 of the fleet operators surveyed said they have only diesel collection vehicles in their fleets. ARB staff calculated approximately 5,000 collection vehicles in the District. Of this number, fewer than 1,000 are operating on alternative fuel or are dual-fuel vehicles with engines operating on a combination of diesel and alternative fuel. More than 4,000 collection vehicles in the District continue running on diesel alone.

2. In-Field Refueling:

Many haulers have told ARB that alternative-fuel vehicles have more limited range on a single fill up when compared to diesel vehicles. Therefore, the survey asked about their ability to fuel vehicles in the field. Fifteen respondents said they could refuel only diesel in the field while two said they could refuel CNG in the field and one said their fleet had the ability to refuel LNG in the field. It is worth noting that refueling diesel in the field can be as simple as bringing a can of diesel fuel to a stranded truck while alternative fuels require more sophisticated refueling equipment.

2. Maintenance Shop Modifications

Fire code and safety regulations for dealing with gaseous fuels add significantly to the expense of creating indoor service facilities where work can be done on alternative fuel vehicles. These facilities are required to have sensors to detect buildup of gas, fire alarm systems, and up-graded air circulation systems. Specialized tools are also required for working on alternative fuel vehicles. Eight respondents said they had modified their shops to handle alternative fuels at costs ranging from $150,000 (Waste Management) to $2 million (Los Angeles Department of General Services). Waste

Management reports modifications to maintenance facilities to handle alternative-fuel vehicles have run from $150,000 to $500,000, depending on the size of the facility and the extent of the modifications. Facilities that do not modify repair shops must work on alternative-fuel vehicles outside in the open air or send them to other repair facilities. The manager of Waste Management's 13-acre, 183-truck San Gabriel facility said he declined to up-grade his maintenance facility because it would have cost approximately $500,000. Three other respondents said they have not upgraded maintenance shops but estimated the costs of doing so from $700,000 to $1.5 million.

3. Fueling Station Costs

Survey respondents reported that the cost for an LNG fueling facility ranged from $600,000 to more than $2 million. Cost estimates for CNG were reported to be from $700,000 to more than $3 million. A more detailed discussion of fueling infrastructure is found in the infrastructure section of the Technical Support Document.

4. Down Time For Alternative-Fuel Vehicles

Of the individuals surveyed, nine said they have found that when there are problems with alternative-fuel vehicles they must be taken out of service for longer periods of time then diesel vehicles before they are repaired and back in service. Down time can run from several days to several weeks. One large hauling firm reported that an early alternative-fuel engine had an average cost of repair more than twice that of comparable diesel engines, and that the average number of repairs per vehicle for LNG units is three times higher than that of a diesel. It reported fewer repair problems with later model alternative fuel engines but that they still lack the horsepower and torque to work all but the lightest collection routes. It expressed hope that the new 8.9L Cummins L-Gas Plus engine would provide not only the required reliability but also the additional power necessary to be used to service an an expanded variety of routes.

5. Cost Of Trucks

Virtually all those interviewed were fairly consistent in their descriptions of the difference between the cost of a standard diesel waste collection vehicle and its alternative fuel counterpart. The consensus was that an alternative-fuel collection vehicle costs about $40,000 to $50,000 more than diesel. The City of Los Angeles provided data for their most recent purchase of collection vehicles showing a cost of $206,508 for LNG vehicles and $156,445 for diesel, a difference of $50,063 more for the LNG vehicles. Both were side-loaders meeting the same specifications. See Appendix D for more detailed information on vehicle costs.

6. Repair Costs

Eight of the survey respondents who have experience with alternative-fuel vehicles said repair costs for those vehicles are significantly higher than for diesel vehicles. Six

haulers said the costs for alternative-fuel and dual-fuel vehicle repairs ran respectively seven percent, 20 percent, 25 percent, 35 percent, 50 percent, and 100 percent more than their diesel counterparts. Many of these haulers also said that repairs are more complex and parts are more expensive for alternative fuel vehicles. One private hauler cited costs such as $656 for a diesel turbo-charger compared to $1,700 for LNG; diesel cylinder head $1,200 compared to $2,500 for LNG, and diesel electronic control module $600 compared to $1,800 for natural gas.

Conversely, however, three of the municipalities surveyed, Burbank, Ontario and Santa Monica, said the costs for maintaining alternative fuel vehicles was about the same as that for diesel trucks, though Ontario said parts are more expensive for alternative fuel vehicles. One municipality that has been using CNG for about eight years reported a preference of CNG to diesel because it brings cleaner air and is a renewable, domestic resource. It reported repair costs for both CNG and diesel trucks to be about the same and that the city would continue using alternative fuel trucks even without a mandate to do so.

7. Alternative-Fuel Vehicle Range

Five of those interviewed said they have found that alternative-fuel trucks, including dual-fuel trucks, travel less distance when filled with fuel than their diesel counterparts. Two respondents also said the alternative-fuel vehicles have less power and torque than diesel vehicles and therefore cannot be used for the range of jobs that diesel trucks perform. However, four of the respondents, all of them speaking for municipal fleets, said they found no problem with the range achieved by alternative-fuel vehicles.

8. Training Staff For Alternative-Fuel Vehicles

Fourteen responders who use alternative-fuel vehicles said staff must receive special training to operate and/or service these vehicles. In some cases haulers write staff training into their new-vehicle or engine purchases. Some haulers said they train their mechanics slowly, over the period when their alternative-fuel engines are still under warranty. Two responders set the cost at $3,000 for training a mechanic to work on alternative-fuel trucks. One responder discussed the need to educate everyone, from city council members on down, in the city's use of alternative-fuel vehicles and the need for continuing education on maintenance and safety issues.

SWCV (Rule 1193) FLEET SURVEY

FLEET BUSINESS NAME:_____

OWNER /MGR/SUPV/SUPT._____Date:_____

CA #_____TERMINAL # _____

QUESTIONS: (Please check or circle the desired answer)

1. Your SWCV fleet size, California_____ SCAQMD Area_____

Fuels Utilized----------

Propane_____
CNG_____
LNG_____
DUAL FUEL_____
CARB DIESEL_____
15 ppm or less ---------- ULSD_____

2. What fuel is available for SWCV'S at fleet or contract facilities?

Propane_____
CNG_____
LNG_____
DUAL FUEL_____
CARB DIESEL_____
15 ppm or less ULSD_____

3, How long has SWCV'S used the following fuels?

Propane_____
CNG_____
LNG_____
DUAL FUEL_____
CARB DIESEL_____
15 ppm or less ULSD_____

4. Does fleet have refueling capability in the field for SWCV'S?

(Yes) (No)

Fuels----------

Propane_____
CNG_____
LNG_____
DUAL FUEL_____
CARB DIESEL_____
15 ppm or less ------ ULSD_____

5. Fleet maintenance shop modified to service alternative fueled SWCV'S? (Yes) (No)
(In progress) (Under construction) Please explain:

_____
_____
_____
_____

6. Does maintenance & repair cost for alternative fueled SWCV's , verses a diesel SWCV's varies greatly? (Yes) (No) (Don't know). If possible, provide copies of repairs of SWCV malfunctions related to fuel usage or problems.

Page 2 (SWCV survey)
The remaining questions are phrased: "IN YOUR OPINION"

7. In reference to SWCV'S, has the employment and usage of Alternative fuel,, ULSF Diesel, or Diesel Particulate Filters (DPF), created any major concerns for operators or maintenance personnel? (Yes) (No) (Don't know). Please include any experiences.

_____
_____
_____
_____

8. Are your fleet or shop mechanics equipped, trained, certified to troubleshoot, repair, or service Alternative fuel or DPF equipped vehicles? (Yes) (No) (Don't know) (None in fleet)

_____
_____
_____

9. If required to expand or modify your current Alternative fuel or DPF equipped SWCV fleet, would maintenance be a major concern? (Yes) (No) (Don't know) (%-fleet) (None in fleet) Please explain:

_____
_____
_____
_____
_____

10. Engine selection varies for SWCV'S, upon a fleet needs to accomplish a mission. Owners are encouraged to select an ARB verified power source that will provide the lowest exhaust emission output possible and is available. Harmful emission reductions for air quality comes with an increased cost for fleet owners, everyone must do their part to help reduce pollution. The Air Resources Board and SCAQMD regulate and monitor air quality in the basin. Improving air quality rests with these agencies. ARB commends your response and reflections on your fleets status, maintenance, and operation. If you have additional input concerning topics not discussed or mentioned previously, please explain:

_____
_____
_____
_____
_____

NOTES:

Fleet Staff: ARB Staff: SCAQMD Staff:

1_____
2._____
3._____
4_____
5._____
6._____
_____Photo's attached (Yes) (No)

Air Resources Board

9480 Telstar Avenue, Suite 4
El Monte, California 91731 www.arb.ca.gov

February 25, 2005 Mail-Out #MSC 05-06

TO: Owners of Solid Waste Collection Vehicles

SUBJECT: REQUEST FOR RECORDS

The Air Resources Board (ARB) adopted the Diesel Particulate Matter Control Measure for On-road Heavy-duty Diesel-Fueled Residential and Commercial Solid Waste Collection Vehicles in September 2003. As of December 31, 2004, all owners of solid waste collection vehicles are required to maintain specific records regarding their vehicles. The record keeping requirement is found in title 13, California Code of Regulations [CCR], section 2021.2 (f):

> **Record Keeping Requirement**. Beginning December 31, 2004, an owner shall maintain the following records. The owner shall provide the following records to an agent or employee of the Air Resources Board upon request for all collection vehicles in his total fleet subject to compliance with this regulation.

Per this requirement, I am hereby calling in the records specified in section 2021.2 (f)(1) for all vehicles housed in terminals located in the South Coast Air Quality Management District (SCAQMD). You are required to deliver these records, by e-mail, fax, or postal mail, within two weeks of the date of this letter, to the following location:

Dr. Nancy L. C. Steele
California Air Resources Board
9480 Telstar Avenue, Suite 4
El Monte, California 91731

Fax: (626) 575-6699
E-mail: swcv@arb.ca.gov

The information we are gathering will be used to assess the status of implementation of the rule, including the effectiveness of the rule in reducing emissions. In addition to this mandatory information request, we are also including in this letter an optional survey we would like you to fill out to help us determine the status of rate negotiations for the costs of implementing the rule.

We are requesting the records and survey information for vehicles in the SCAQMD at this time but plan to expand this survey throughout the state later this year. Therefore if you have vehicles located outside of the SCAQMD and would like to provide this information for all of your vehicles, please segregate the data into two groups – SCAQMD and other.

Please feel free to contact Ms. Annette Hebert, Chief, at (626) 575-6973 or by email ahebert@arb.ca.gov, or Dr. Nancy Steele, Manager, at (626) 350-6598 or by email nsteele@arb.ca.gov, if you have any questions or need additional information.

Sincerely,

/s/

Robert H. Cross, Chief
Mobile Source Control Division

Attachment

cc: Ms. Annette Hebert, Chief
Heavy-Duty Diesel In-Use Strategies Branch

Dr. Nancy Steele, Manager
Retrofit Implementation Section