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Vehicle Characterization for the TAPCUT Project: Materials, Energy, and Residuals of Manufacture for Vehicles, Fuels, and Rights-of-Way

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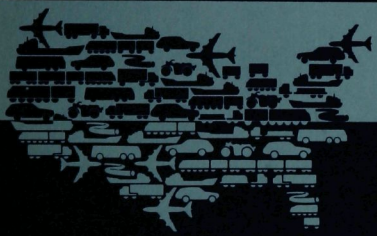

Center for Transportation Research

Energy and Environmental Systems Division
ARGONNE NATIONAL LABORATORY

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VEHICLE CHARACTERIZATION FOR THE TAPCUT PROJECT: MATERIALS, ENERGY, AND RESIDUALS OF MANUFACTURE FOR VEHICLES, FUELS, AND RIGHTS-OF-WAY

by

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FOREWORD

Transportation directly consumes one quarter of the energy used in this country, with auto passenger travel accounting for half of the transport sector's energy use. Due to rising fuel prices and intermittent shortages, agencies of federal, state, and local governments have begun to introduce various strategies (combinations of policies and technologies) designed to conserve urban-transporation energy while maintaining a productive economy. The environmental consequences of many of these conservation strategies have not been adequately assessed. As a result, a technology assessment project sponsored by the U.S. Department of Energy, under the direction of David O. Moses, was initiated at Argonne National Laboratory in late 1979, with assistance from Brookhaven and Oak Ridge National Laboratories.

This project, Technology Assessment of Productive Conservation in Urban Transportation (TAPCUT), had the stated goals of providing (1) a description of several alternative strategies promoting energy conservation in urban passenger transportation, (2) a better understanding of the environmental impacts of such strategies, and (3) identification of the constraints on the implementation of such strategies.

Two productive conservation strategies were designed to save energy in urban passenger transportation when substituted for policies now in place. A reference set of impact forecasts was then prepared for these two strategies. One conservation strategy stressed group travel, e.g., transit and carpooling, while the other promoted individual travel in private automobiles. The strategies were designed to cause minimal disruption of lifestyles and the economy while achieving reductions in the consumption of aggregate energy, especially that derived from petroleum.

Travel demand analysis was performed for each of three typical cities under policies now in place and forecast to continue, and under the alternative strategies, i.e., Group Travel Strategy and Individual Travel Strategy. Environmental impact analysis of the forecast travel demand under each strategy was city-specific and included estimation of air and water pollutant burdens along with their associated impacts on human health. Traffic safety impacts were also estimated. Socioeconomic impacts due to vehicle use and vehicle production were assessed. Impacts on physical environment, resources, health, and safety caused by vehicle and fuels production and infrastructure construction were also addressed. The final step was the overall comparison of policy-driven results to the results obtained under the In-Place Policy set.

Two economic and social-organization scenarios also were defined for this project; they differed in Gross National Product (GNP) growth rate, social organization, retail fuel price, total metropolitan population, average household income, environmental regulations, and types of fuel available for transportation. The two scenarios can be briefly distinguished as Scenario I, a wealthy economy with high technological success, and Scenario III, a relatively poor economy with low technological success. National urban and city specific forecasts of population and employment characteristics were prepared under each scenario.

The cities were selected using a factor-analysis technique that identified extreme cities along three dimensions relevant to transportation energy use. One dimension, called Megatown, identifies large cities with good transit systems. The second dimension, Sprawlburg, typifies newer, fast-growing, sprawl cities. The Slowtown dimension identifies midwestern industrial cities that are smaller in population than the other two. All metropolitan areas in the nation were related to these three dimensions; an expansion method was then developed in order to make national urban forecasts based on the detailed forecasts of the three typical cities selected to represent the three dimensions.

Automobile and transit vehicle characteristics were projected in detail under several sets of policy and scenario conditions. Three different sets of vehicles were used in the analysis: Set C, the expected technologies, was used for the In-Place Policy and Group Travel Strategy in both scenarios; Set A, designed as the best technology for both conservation and performance, was tested for the Individual Travel Strategy in one scenario; the third set, a modification of Set C, was tested in the other scenario under the Individual Travel Strategy. Vehicles were characterized by size class, engine type, fuel economy, emissions profile, purchase price, operating costs, materials composition, and (for personal vehicles) performance.

The city-specific land-use and demographic forecasts were organized for input to the Urban Transportation Policy Analysis Package. It incorporated state-of-the-art, household-based, disaggregate travel demand models for mode and destination choice with detailed specification of individual household auto ownership by automobile technology. Household characteristics from the base year in each city's travel survey were the basis of the approach to forecasting travel demand. Household records modified for each scenario, combined with the transportation level-of-service forecasts, which varied by policy, for the horizon years 1990 and 2000 drove the travel demand model. Transportation level-of-service parameters included detailed specifications of transit service and automobile characteristics. Both work and nonwork travel are separately forecast and reported for households in three income classes and for three locations within the urban area (center city, suburban, and exurban). Vehicle travel is also reported by area of occurrence for the air emissions and traffic safety analysis.

Results for the entire TAPCUT project will be presented in a final report. This technical memorandum is one in a series of TAPCUT working papers that was selected for publication as a separate document to supplement the final report. The topic covered here is considered to be of interest to certain researchers/users who would not need to explore the full scope of TAPCUT. Conversely, the detail of presentation herein is inappropriate for the project's final report.

This report is one of two TAPCUT reports that characterize the vehicles for the TAPCUT project. The companion report [Hudson, C., E. Putnam, and M. Bernard, Vehicle Characterization for the TAPCUT Project: Performance and Cost, Argonne National Laboratory Report ANL/EES-TM-171 (Sept. 1981)] contains a detailed description of (1) the automobiles, vans, and transit vehicles used in the study and (2) the methods used to characterize the vehicles. Included are vehicle weights, initial and operating costs, and performance data. Performance data include power-to-weight ratios, ranges (for

electric vehicles), quantity of fuel or electricity consumed, and the distribution of materials used in bodies/chassis, engines, batteries, and motors. This report characterizes many of the processes used for vehicle manufacture, fuels production, and rights-of-way construction on the basis of materials and energy requirements and residuals.

VEHICLE CHARACTERIZATION FOR THE TAPCUT PROJECT: MATERIALS, ENERGY, AND RESIDUALS OF MANUFACTURE FOR VEHICLES, FUELS, AND RIGHTS-OF-WAY

by

Charles L. Hudson,* Evelyn S. Putnam,* and Roy Hildestad*

1 FUELS PRODUCTION

The following fuel/production characteristics were analyzed:

- The energy consumed, lost, and unrecovered in delivering a unit of coal-derived fuel by energy type, e.g., coal, oil, and electricity, etc. (Note: additional analyzes of coal-derived fuels and other fuel appear in Ref. 1.)
- The amounts of major air and water pollutants (CO, NO_x, SO_x, particulates, HC, metals, etc.) generated in 10 fuel-production paths and the amount of solid waste generated per unit of fuel delivered to the vehicle.
- For 10 fuel-production paths, the amounts of special materials (e.g., metals for catalysts in producing coal-derived gasoline), other fuels (e.g., process heat for alcohol), and water required to deliver a unit of fuel to the vehicle.
- Current and potential refinery practices relevant to the transportation fuels that affect air emissions and the identification of major issues/practices.

First, the various fuel production paths that could be followed in producing transportation fuels were considered. Figures 1-5 show most of the paths found in the literature surveyed. Although this tabulation is not comprehensive (for example, hydroelectric and geothermal production of electric power have been omitted), it demonstrates the diversity of options available. Aspects of the following 10 fuel-production paths were considered in detail:

Electricity

1. Southwest coal, area strip mining, conventional steam boiler power plant.
2. Northern Appalachian coal, underground mining, conventional steam boiler power plant.
3. Northwest coal, area strip mining, Lurgi low-Btu gas feedstock, combined-cycle power plant.
4. Light water reactor (LWR), nuclear power generation.

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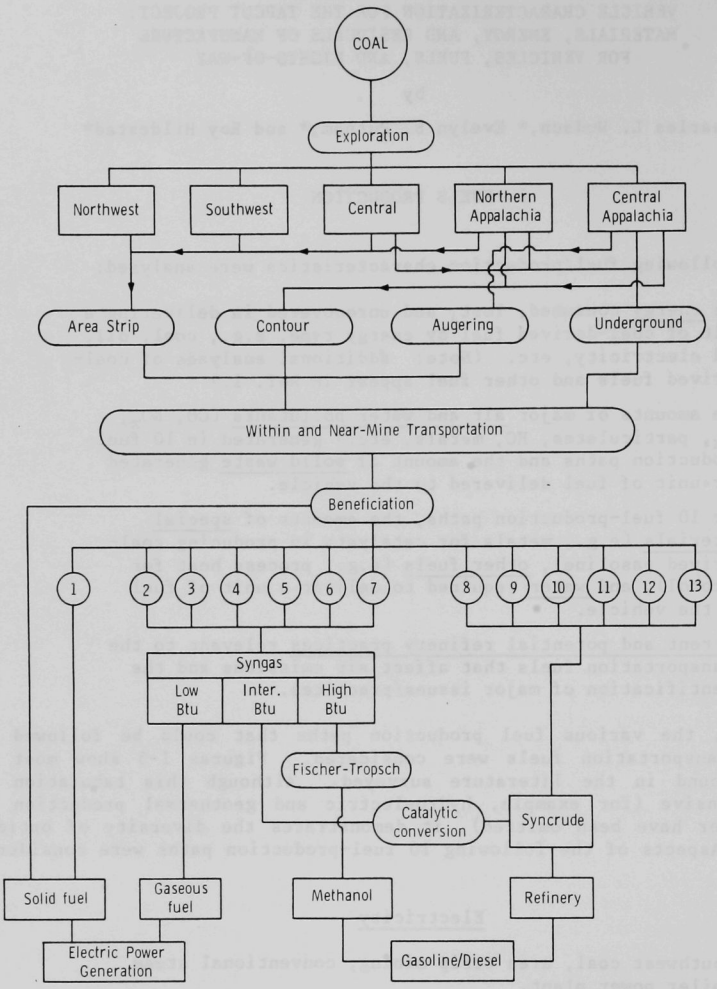

1: Solvent refined solids
2: Lurgi
3: HYGAS
4: BI-GAS
5: Synthane
6: CO_2 acceptor
7: Underground gasification
8: Synthoil
9: H-Coal
10: Solvent refined coal
11: Consol synthetic fuel
12: COED
13: TOSCOAL

Fig. 1 Coal Resource Fuel Production Path

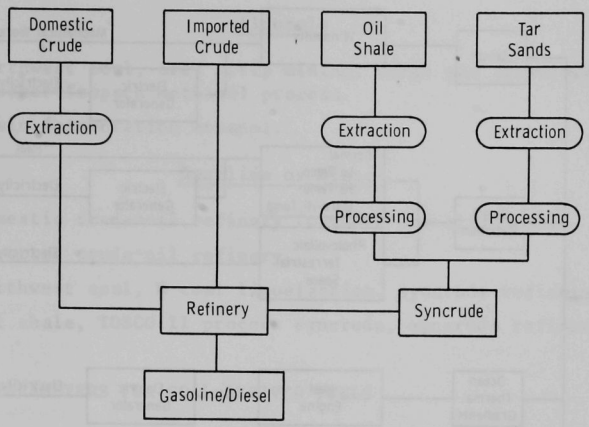

Fig. 2 Petroleum Resource Fuel Production Path

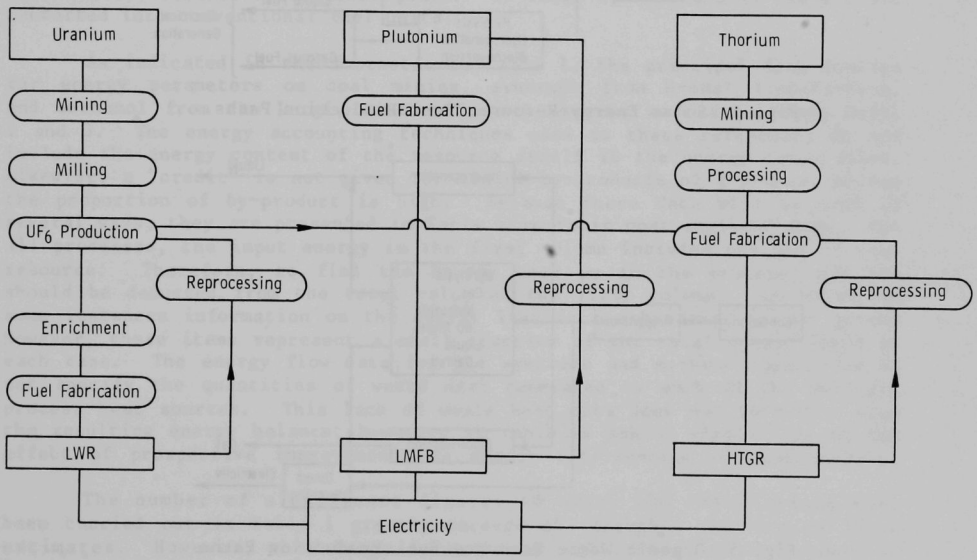

Fig. 3 Nuclear Energy Resource Fuel Production Paths

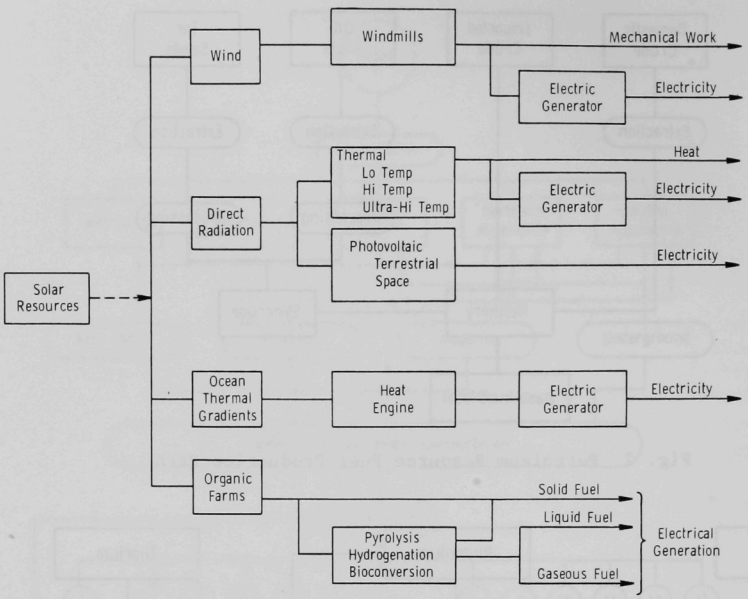

Fig. 4 Solar Energy Resource Fuel Production Paths

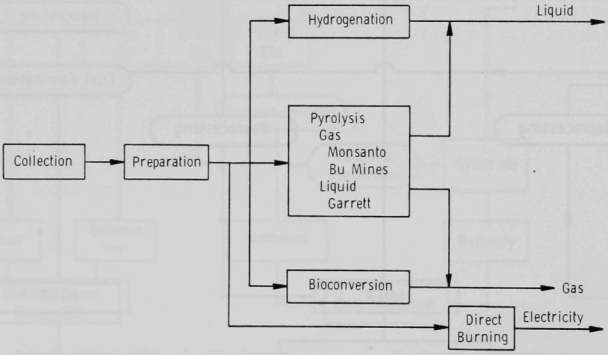

Fig. 5 Organic Waste Resource Fuel Production Paths

Alcohols

5. Northwest coal, area strip mining, Lurgi gas feedstock, Fischer-Tropsch methanol process.
6. Grain fermentation ethanol.

Gasoline or Diesel

7. Domestic crude-oil refinery (onshore and offshore).
8. Imported crude-oil refinery.
9. Northwest coal, H-coal liquefaction, syncrude refinery.
10. Oil shale, TOSCO II process syncrude, syncrude refinery.

1.1 ENERGY PARAMETERS FOR COAL-DERIVED FUELS

Table 1 summarizes the data available on the energy consumed and lost during production of a Btu of coal, syncrude (H-coal liquefaction), methanol (Lurgi, Fischer-Tropsch), and electricity using conventional steam boilers and an advanced combined-cycle power plant. In Table 2, the data of Table 1 are converted into conventional fuel units.

As indicated in the footnotes to Table 1, the principal data sources for energy parameters on coal mining, syncrude from H-coal liquefaction, and methanol from the Lurgi, Fischer-Tropsch process were drawn from Refs. 2 and 3. The energy accounting techniques used in these references do not include the energy content of the resource itself in the energy computation. Likewise, a "credit" is not given for useful by-products of a process unless the proportion of by-product is high. Because these data will be used in several ways, they are presented in Table 1 in their most explicit form. For all processes, the input energy in the first column includes one Btu of coal resource. Therefore, to find the energy used up in the process, one Btu should be deducted from the total value of the first column. As noted, in some instances information on the energy lost in a subprocess is not given. However, these items represent a small fraction of the total energy input in each case. The energy flow data for the syncrude and methanol processes do not specify the quantities of waste heat generated by each of the multiple process heat sources. This lack of waste heat data does not interfere with the resulting energy balance; however, it inhibits making predictions on the effect of prospective improvements in energy efficiencies of subprocesses.

The number of significant figures to which the calculations have been carried out in Table 1 greatly exceeds the probable accuracy of these estimates. However, when large factors are multiplied, errors inherent in rounding are magnified. To reduce these errors when this data is used, the calculations were carried to several significant figures.

Table 1 Energy Consumed and Lost in Producing a Btu of Coal-Derived Fuel

Process	Input Btu per Btu Fuel Produced	Btu of Useful Output Products	Btu Lost per Btu Fuel Output
Southwest Surface Coal Mining[a]			
Mine construction[b]	0.001092		
Operating materials[b]	0.004736		
Electricity	0.010690		0.007816
Diesel fuel	0.001839		0.000230
Coal	1.000000	1.000000	
Total	1.018357	1.000000	0.008046
Syncrude from H-Coal Liquefaction[c]			
Coal mine construction[a]	0.001726		
Coal operating materials[a]	0.007484		
Coal mine electricity[a]	0.016892		0.012351
Coal mine diesel fuel[a]	0.002906		
Coal transport[c]	0.010238		
Syncrude plant construction[a]	0.009677		
Catalysts and chemicals	0.013441		
Maintenance supplies[b]	0.004301		
Coal for process heat/steam	0.206349		
Coal for liquefaction	1.312169		
Coal for electricity	0.061728		0.040564
Waste heat			0.509700
Ash and char			0.015873
Sulfur and ammonia		0.014109	
Syncrude		1.000000	
Total	1.646911	1.014109	0.578488
Methanol from Lurgi Process[d]			
Coal mine construction[a]	0.002778		
Coal operating materials[a]	0.012049		
Coal mine electricity[a]	0.027197		0.019885
Coal mine diesel fuel[a]	0.004679		
Coal transport[a]	0.005356		
Methanol plant construction[b]	0.015068		
Catalysts and chemicals[b]	0.015068		
Maintenance supplies[b]	0.006849		
Coal for process gas/steam	0.838235		
Coal for methanol production	1.705883		
Process waste heat			1.069893
Ash			0.033088
Higher alchol		0.007353	
Tar, oil, naphtha		0.397059	
Sulfur, phenol, ammonia		0.036747	
Methanol		1.000000	
Total	2.633162	1.441159	1.122866

Table 1 (Cont'd)

Process	Input Btu per Btu Fuel Produced	Btu of Useful Output Products	Btu Lost per Btu Fuel Output
Electricity, Conventional Steam (40% efficiency)			
Mine construction[b]	0.002730		
Operating materials[a,b]	0.011839		
Mine electricity[a]	0.026724		0.019539
Mine diesel fuel,[a,b]	0.004598		
Coal	2.500000		
Coal transport[e]	0.028467		
Boiler waste heat[f]			0.437500
Steam turbine conversion loss[f]			1.031250
Generation conversion loss[f]			0.030938
Electricity		1.000000	
Total	2.574358	1.000000	1.519227
Electricity Advanced Combined Cycle (55% efficiency)[g]			
Mine construction[a,b]	0.001985		
Operating materials[a,b]	0.008610		
Mine electricity[a]	0.019436		0.014210
Mine diesel fuel[a,b]	0.003344		
Coal	1.818181		
Coal transport[e,b]	0.020890		
Gasification conversion loss (75.8% efficiency)[g]			0.440000
Gas and steam turbine conversion Loss			0.363054
Generation conversion loss[c]			0.015127
Electricity		1.000000	
Total	1.872446	1.000000	0.832391
Ethanol, Corn Fermentation			
Corn production transportation[b,h]	0.436449		
Corn[h]	1.775514		
Electricity[h]	0.155327		0.093196
Coal-fired steam boiler	0.492150		0.246075
Plant construction[h,i]	0.040398		
Operating materials[h,j]	0.042857		
Dry distiller's grains[h]		0.668785	
Ethanol		1.000000	
Total	2.942695	1.668785	0.339271

[a]Ref. 1, p. 95.

[b]"Lost" energy not specified.

[c]Ref. 1, pp. 144, 199.

[d]Ref. 1, pp. 140, 202.

[e]Ref. 3, pp. 4-11.

[f]Ref. 4, pp. 12-16, 12-17.

[g]Ref. 5, p. 10.

[h]Ref. 6.

[i]Shale oil plant used as surrogate. $58 million capital investment, 20-yr operating life, 50 million gal annual output.

[j]Shale oil plant used as surrogate. $873,000/yr, operating chemicals; 50 million gal annual output.

Table 2 Input Energy Used (including basic resource) to Produce a Unit of Transportation Fuel

Fuel	Unit	Btu/Unit	Btu Used
Coal, surface mined	ton	17.4×10^6	17.72×10^6
Coal syncrude	barrel	5.8×10^6	9.55×10^6
Methanol (coal based)	gal	64,672	170,529[a]
Electricity: coal-fired steam	Wh	3.412	8.784
Electricity: advanced combined cycle	Wh	3.412	6.389
Ethanol, corn fermentation	gal	87,100	256,309[b]

[a]28,531 Btu useful products also produced.

[b]58,251 Btu useful products also produced.

1.2 MAJOR AIR AND WATER POLLUTANTS AND SOLID WASTE GENERATED IN THE PRODUCTION OF FUELS

Table 3 lists the residuals characterized for each of the 10 fuel production paths studied. Reference 4 is the primary source for this information. That source, in turn, is primarily based on another report by Battelle.[7] There are contradictions in these two sources, however. The primary source for this study[4] uses generalized assumptions or differences in coal characteristics by source of the coal, even though the Battelle report[7] has more accurate data. The Battelle information is confirmed by two other sources.[2,8] In spite of these limitations, the Kash report[4] is the primary source of data because of its consistent presentation and thorough coverage of all energy sources.

The data on uncontrolled water pollutants are weak. For the most part, water pollutants are currently being controlled, and most authors consider that such controls will continue. Additional data are available if a more detailed examination of uncontrolled water pollution is warranted. For example, the residuals in the effluents from biological treating pond water are available for a number of processes and could be used to generate estimates of uncontrolled water pollution.

The nonradioactive emissions (SO_x, NO_x, hydrocarbons, and CO) reported for the LWR power plant purport to represent the emissions from secondary power sources. However, on a per-Wh basis, these emissions, in some cases, exceed similar emissions from controlled, coal-based power sources.

All of the data on residuals per gallon of gasoline or diesel delivered to the gasoline station reflect averaging procedures that do not produce totally correct results. For instance, data are available on both controlled and uncontrolled residuals from refining various types of crude oil.[7] These values were used as surrogate values for the H-coal syncrude and oil-shale crude, despite the fact that the syncrude products are likely to differ markedly in some chemical constituents. Data are available on the residuals

Table 3 Residuals Characterized for Energy Paths Studied

Fossil and Biomass Paths

Air Pollutants	Water Pollutants	Thermal	Solids
- Particulates	- Acids	- No categories	- No categories
- SO_x	- Bases		
- NO_x	- PO_4		
- HC	- NO_3		
- CO	- TDS		
- Aldehydes	- SS		
	- Organics		
	- BOD		
	- COD		

Light Water Reactor Path

Liquids	Thermal	Gases	Particulates	Solids
- Ra_{226}	- No categories	- SO_x	- No categories	- Low level radioactives
- Th_{230}		- NO_x		- Nonradio-actives
- Uranium		- HC		
- Th_{234}		- CO		
- NO_3		- Rn_{222}		
		- Ra_{226}		
		- Th_{230}		
		- Uranium		

resulting from each subprocess within the refinery.[9] However, these are expressed in terms of residuals per input-feedstock flow volume. Hence, to properly allocate the residuals among the end-use products in a refined barrel would require tracing the flow volumes through each subprocess of a refinery designed to give a specified distribution of end products and based on an input crude of known specifications. The effort involved is not likely to improve results for TAPCUT, as individual refiners have considerable latitude in changing the product slate at a specific plant. The use of the averages will show changes in residuals related to total fuel demand and the characteristics of the feedstock (synthetic fuels or crude oil) for the refinery.

1.3 AMOUNTS OF WATER, SPECIAL MATERIALS, AND OTHER FUELS USED IN THE PRODUCTION OF TRANSPORTATION FUELS

The water requirements for various aspects of fuel production are located in the literature.* Although the estimated quantities of water required for the production of the various fuels in some cases varied considerably, an attempt was made to select a single representative value for each fuel type and production path for which there was information. These judgmental values are presented in Table 4.

*References for Sec. 1.3 are: 2, 4, 8, and 10-14.

It is interesting to note that, although the water requirements for syncrude production have been cited as a limiting constraint to commercialization, these requirements are (on a volumetric basis) an order of magnitude less, for the most part, than the water requirements for the bioconversion of grain to ethanol. Although all of these values could be considered suspect (and the degree to which water recycling might be possible is not documented), the nature of the fermentation process lends credibility to the value shown. The reason why the water requirements for grain fermentation to ethanol have not heretofore been considered a constraint probably lies in the fact that the projected region for such a development has been the Midwest where water availability is not a major issue.

Limited information was located in the literature relevant to catalysts and special materials required for the fuel production processes studied.[2,4] For the most part, the literature provided qualitative rather than quantitative descriptions of the fuel-production processes. Further investigation should be made of the source references quoted in the literature cited and the specific chemical composition of catalysts that contain critical materials ascertained. Nickel, nickel oxide, and zinc oxide were the only catalysts for which metallic weight per unit of fuel could be obtained. Based on these data, the largest metallic consumption per gallon of fuel is 285.3×10^{-6} nickel/gal gasoline or diesel fuel from H-coal liquefaction. Scaled up to reflect the fuel requirements of 50 million vehicles, an annual consumption of 2,710 tons of nickel is implied $[(50 \times 10^{6} \times 10{,}000 \text{ mi} \times 0.038 \text{ gal/mi} \times 285.3 \times 10^{-6})/2000]$. In this same process, the requirement for "cobalt-molybdenum catalyst" is 8.679×10^{-3} lb/gal. The relative quantities of cobalt and molybdenum in the catalyst are not given, but, because of the criticality of cobalt supply, this ratio should be ascertained.

The quantities of other fuels required for fuel production were also collected but are not presented here. Total energy required to produce the fuels is presented in Ref. 1.

1.4 CURRENT AND POTENTIAL REFINERY PROCESSES AFFECTING AIR EMISSIONS

Many of the documents contained in the references discuss one or more aspects of fuel production that affect air emissions. However, a few of the documents provide thoughtful and well-informed summaries of these issues. Perusal of any one of the following specific documents will quickly reveal the major issues and practices within the technologies that influence air emissions.

Fuel	References
All Fuels	4, 8, 12
Coal	15
Coal Gasification and Liquefaction	2, 16, 17, 18
Oil Shale	14, 19
Alcohol	20, 21

Table 4 Water Requirements for Fuel Production

Fuel Type	Quantity	Reference
ELECTRICITY (10^{-6} gal water/Wh)		
Coal-fired steam	130	13
Nuclear	800	a
Low-Btu coal gasification:		
Gasification (recycled)	20	8
Combined cycle power plant[b]	65	
	85	
ALCOHOLS (gal water/gal fuel)		
Coal-Methanol	4.7	2
Bioconversion-Ethanol	48.5	10
GASOLINE/DIESEL (gal water/gal fuel)		
Refined natural crude	1.0	12
Refined syncrude[c]		
Fischer-Tropsch[d]	16.2	8
"Other than Fischer-Tropsch"[d]	7.8	8
H-Coal	4.9	13
Oil shale:		
TOSCO II	4.5	14
Union B	3.0	14
Lurgi-Ruhrgas	2.3	14
Superior	3.6	14
In situ (modified)	2.8	14
In situ/surface processing	2.5	14

[a]Source: U.S.G.S. Circular No. 703.

[b]Assumed at 50% of coal-fired plant because half of the power is generated by steam turbines.

[b]Includes 1 gal water/gal fuel for refining process.

[d]Recycled. Recycling reduces water consumption by 50%.

1.5 DISCUSSION

1.5.1 Fuel-Production Paths

The fuel-production paths presented in this report are those that the authors of this report consider to be the most plausible or ready for commercialization. However, certain of these paths may be favored according to the socioeconomic characteristics pertinent to each of the TAPCUT scenarios. The fuel paths used in the TAPCUT analysis are reported in Ref. 1.

1.5.2 Literature Sources

Although there is a wealth of literature on the subject of fuel production, much of the basic information is fairly old and many of the secondary sources cited in the literature were not reviewed due to time constraints. It is possible that more-recent, unpublished work may provide additional insight should the opportunity to update the analysis arise. In particular, process details were not available for most of the technologies relevant to the chemical composition of catalysts and special materials consumed.

1.5.3 Energy Parameters

The data contained in this report constitute only a portion of the data on energy consumed and lost in the production of transportation fuels. In addition, because this information has been generated from several sources, each of which uses somewhat different energy accounting techniques, the values given here represent a synthesis of these data.

1.5.4 Air and Water Residuals and Solid Waste

As with the energy parameters discussed above, the sources for the data base on residuals and solid waste are many, and the ways water residuals are assessed by different authors were found to vary. The values given in this report represent a synthesis of these data.

An interesting effect found in the existing data base is that treatment of solid wastes frequently increases the volume of such wastes. This secondary effect was not considered in this analysis.

2 INFRASTRUCTURE CONSTRUCTION

The characterization of the urban transportation infrastructure includes capital-cost, energy-use, air and water pollution, and bill-of-materials factors for constructing light-rail, rapid-rail, commuter-rail, highway (expressway/freeway), and express-busway transportation systems. For each system, the different types of structures (e.g., aerial, at-grade, and underground) were analyzed and separate factors were developed for each. In addition, different factors for each type of structure and system by location class (suburban, center city, central business district or CBD) were developed. Factors are reported in units per route- or lane-mile to facilitate computation of system-wide values for planned or hypothetical systems.

2.1 METHODOLOGY

2.1.1 Approach

Three techniques were used in developing the cost, energy, pollution, and materials factors for each system. First, the literature was reviewed for studies containing work directly applicable to the data requirements of the present effort (i.e., factors for the same facilities at similar levels of aggregation). Data obtained in this literature review were generally used at face value. Where two authors reported significantly different values, attempts were made to reconcile the differences and arrive at reasonable mean values. Capital-cost factors for all systems and energy-use factors for highway systems were obtained in this manner.

Second, when directly applicable published data were not available, the factors were estimated from standard designs of each of the system structures. In this method, energy and pollution factors for each of the basic materials in a structure and for each construction process were obtained from the literature. The bill of materials for the structure was estimated from the dimensions of the structural components. The energy and emission factors were multiplied by the bill of materials to obtain total energy and emission factors for the structure. Bills of materials, energy factors, and pollution factors were obtained by this method for rapid-rail, aerial, subway, and tunnel structures; for commuter-rail at-grade construction; and for busway at-grade and subway structures, as well as for aerial stations.

Third, when reliable average dimensions of structures were not available or when the literature stated that one structure was identical to another for which data was available, the method of analogy was used. In this technique, the factors derived for a rapid-rail subway, for example, were used as surrogates for light-rail subway factors after they were adjusted for differences in electrification systems and station designs. The method was used to estimate materials, energy, and pollution factors for light-rail aerial, at-grade, subway, and tunnel structures, and for highway aerial, and busway aerial guideways.

To maintain comparability of the study results across system and factor types, the explicit or implicit design assumptions of the capital-cost factors

were followed in developing the energy, pollution, and materials factors. The main source for the capital-cost factors contained a comprehensive analysis of all but one of the transit systems analyzed in this study and, hence, was used as a cross-system standard. The assumed characteristics of each system are given in the footnotes to the tables of results.

2.1.2 Materials Analyzed

Due to the inadequacy of published data in this area, only the major construction materials and processes were analyzed. The materials included in the study are steel, Portland cement, asphalt, sand and gravel aggregates, crushed stone aggregate, stone railway ballast, wood, copper, and porcelain. Many minor materials such as plastics, sealants, glass, ceramic tile, aluminum, etc., are part of the structures analyzed and could have some impact on the factors reported here. However, the amounts of these materials could not be reliably determined.

Construction processes included in this analysis are excavation (open-ground and cut-and-cover), rock tunneling, earth tunneling, aggregate production and placement, hauling, asphalt concrete production and placement, Portland-cement concrete production and placement, and reinforced-concrete-structure construction. Data on most of the processes were specific to highway construction. However, a reasonable extension of the process data was made to simulate rail construction processes, as required.

2.1.3 Units

All factors were converted to applicable route- or lane-mile units. Rail and busway systems were treated in route-miles; highway systems were expressed in lane-miles. One rail route-mile includes two parallel tracks with stations at specific frequencies depending on location class. One lane-mile of highway includes a 12-ft-wide cement-concrete traffic lane and a 6-ft-wide asphalt-concrete shoulder. A busway route-mile includes a 41-ft-wide two-lane busway of asphalt concrete. Cross sections of all facilities are dimensionally reduced in underground and aerial structures.

2.2 CHARACTERISTICS

Tables 5 through 9 present the capital costs, and the tables in Appendix A present materials, energy and pollution factors for each type of right-of-way. To disaggregate energy use and residuals for mining and manufacturing, an attempt was made to segregate the reported estimates by location. In the case of fuels and air residuals, identification of mining and manufacturing components could not be reliably separated for all materials. In place of this separation, the output was divided according to whether the consuming or emitting process was located at the transportation facility construction site or at a manufacturing plant. These location groups are identified in the Appendix A tables as "on-site" and "off-site", respectively. Under each fuel and residual type in the tables, the first number is the off site value; the second number is the on site value. In these estimates, asphalt-concrete and Portland-cement-concrete batching are assumed to occur on-site.

Table 5 Light Rail Capital Cost per Route Mile by City Size and Construction Type (millions of 1976 $)

Location Class	Construction Type					
	Aerial	At Grade	Cut and Cover Subway	Rock Tunnel[e]	Earth Tunnel[e]	Land[c]
Population > 1 million[a]						
Suburban	10.8	2.4	27.3	13.3	22.1	1.9
Center City	17.5	3.5	62.3	23.5	30.9	2.1
CBD	26.4	5.6	98.3	47.5	48.1	3.2
Population 500,000 to 1 million[a]						
Suburban	10.2	1.8	26.7	12.7	21.4	1.3
Center City	17.0	3.0	61.8	23.0	30.4	1.6
CBD	25.3	4.1	97.2	46.4	47.0	2.1
Population 100,000 to 250,000[a]						
Suburban	10.0	1.6	26.5	12.5	21.3	1.1
Center City	16.6	2.4	61.4	22.6	30.0	1.2
CBD	24.5	3.3	96.4	45.6	46.2	1.3
Stations[b,d]						
Suburban	2.0	0.1	8.1	1.6	2.8	N/A
Center City	2.0	0.1	8.4	3.1	4.3	N/A
CBD	2.0	0.1	10.4	6.3	6.4	N/A

Source: Refs. 22 and 23.

[a]Population ranges show assumptions for proration of land cost.

[b]Station frequency per mile assumed the following:

	Aerial	At Grade	Subway
Suburban	0.5	1	0.5
Center City	1	2	1
CBD	2	4	2

Aerial and subway station frequency assumed equivalent to rapid rail.

[c]Land cost portion of total cost.

[d]These costs are adjusted from the sources to maintain consistency with the rapid-rail costs.

[e]Values shown are rapid-rail costs reduced by 15% to account for smaller tunnel cross section. If the light rail is assumed to be "Pre-metro", the rapid-rail costs are used.

Table 6 Rapid Rail Capital Cost per Route Mile by City Size and Construction Type (millions of 1976 $)

Location Class	Construction Type					
	Aerial	At Grade	Cut and Cover Subway	Rock Tunnel	Earth Tunnel	Land[a]
Population > 1 million[b]						
Suburban	10.1	6.2	31.8	15.3[c]	25.7[c]	1.9
Center City	15.5[c]	16.8	72.9	27.3	36.0	2.1
CBD	21.0	29.3[c]	115.0	55.3	56.0	3.2
Population 500,000 to 1 million[b]						
Suburban	9.5	5.6	31.2	14.7[c]	25.1[c]	1.3
Center City	15.0[c]	16.3	72.4	26.8	35.5	1.6
CBD	19.9	28.2[c]	113.9	54.2	54.9	2.1
Population 100,000 to 250,000[b]						
Suburban	9.3	5.4	31.0	14.5[c]	24.9[c]	1.1
Center City	14.6[c]	15.9	72.0	26.4	35.1	1.2
CBD	19.1	27.4[c]	113.1	53.4	54.1	1.3
Stations[c]						
Suburban	3.0	2.0	9.5	1.9[c]	3.3[c]	N/A
Center City	3.5[c]	3.6	9.1	3.7	5.0[c]	N/A
CBD	4.0	5.2[b]	12.2	7.4	7.5[c]	N/A

Source: Ref. 23.

[a]Land cost portion of total cost.

[b]Population ranges show assumptions for proration of land cost.

[c]Estimated.

[d]Station frequency per mile estimated from Bay Area Rapid Transit (BART) is 0.5 suburban, 1.0 center city, and 2.0 CBD.

The organization of each type of table and the general assumptions used in the calculation of factors for each parameter are described below.

2.2.1 Standard Designs

2.2.1.1 Rapid Rail

Rapid-rail factors were estimated from architectural cross sections of present standard guideway and station types. Aerial sections assume

BART-type structures. At-grade sections assume standard commercial railway design with pre-stressed concrete ties in place of wood-treated ties. Underground structures assume standard engineering guidelines for floor, ceiling, wall, and platform dimensions. Mezzanines were included in materials for cut-and-cover stations, but not for rock or earth tunnel stations. Rock tunnels assume a single double-track bore, whereas earth tunnels include two parallel single-track bores.

Table 7 Commuter Rail Capital Cost per At-Grade Route Mile

Location Class	Cost[a] (10^6 1976 $)
Suburban	2.7[b]
Center City	6.2[c]
CBD	10.2[d]
Stations[e]	
Suburban	0.3
Center City	0.3
CBD	0.5

Source: Ref. 24.

[a]Data are for rehabilitation of an existing single track line into a double track facility with new electrification. Cost of yards and shops not included.

[b]Assumes rebuilding of one overpass and one underpass per route-mile.

[c]Assumes rebuilding of three overpasses and three underpasses per route-mile.

[d]Assumes rebuilding of five overpasses and five underpasses per route-mile.

[e]Assumes five car trains and station frequency per mile of 0.33 suburban, 0.66 center city, and 1.0 CBD.

2.2.1.2 Light Rail

Light-rail at-grade and aerial sections were assumed to be architecturally identical to those for rapid rail. Factors were adjusted to account for different power distribution systems, station frequencies, and station platform heights and lengths. The light-rail factors for underground rail lanes were derived by reducing rapid-rail materials by 15% and adding the components of the overhead power distribution system in place of a third rail. The 15% reduction in materials requirements is suggested in the literature as a reasonable adjustment for the smaller cross section of light-rail vehicles.

The distinction between light-rail and rapid-rail subways may be artificial for two reasons. First, underground facilities for light-rail transit are likely to be "pre-metro," that is, built with the expectation of future upgrading to rapid rail, since the high cost of any subway construction would have to be justified by a large existing demand with growth potential, and the difference between light- and rapid-rail subway construction costs is marginal. Second, the alternatives to subways are lower-cost grade-separation options, such as aerial constructions, which are essentially identical to rapid-rail structures. Adjusted light-rail transit (LRT) subway values are reported here to indicate the implications of strict light rail vs. pre-metro assumptions concerning LRT systems. In keeping with these assumptions, stations for LRT were estimated to be one-third the length of comparable rapid-rail stations.

Table 8 Highway Rail Capital Cost per Lane Mile by City Size and Construction Type (millions of 1976 $)

Location Class	Construction Type[a]					
	Aerial	At Grade	Open Cut	Cut and Cover	New Roads	Land[b]
Population > 1 million[c,d]						
Suburban	4.8	1.9	2.4	8.5	1.9	0.84
Center City	7.7	2.1	2.5	12.1	2.5	0.94
CBD	11.0	2.7	3.0	19.0	3.1	1.45
Population 500,000 to 1 million[c,d]						
Suburban	4.6	1.7	2.2	8.3	1.5	0.60
Center City	7.3	1.7	2.1	11.7	1.8	0.54
CBD	10.5	2.2	2.5	18.5	2.4	0.94
Population 100,000 to 250,000[c,d]						
Suburban	4.5	1.6	2.1	8.2	1.3	0.47
Center City	7.3	1.7	2.1	11.7	1.5	0.51
CBD	10.1	1.8	2.1	18.1	2.0	0.56

Source: Ref. 23.

[a]Breakdown by type estimated for total roads using representative percentages of roadway type by location class.

[b]Land cost portion of total cost.

[c]Population ranges show assumptions for proration of land cost.

[d]Bridge frequency per mile was assumed to be as follows:

	Population		
	> 1 million	500,000 to 1 million	Average
Suburban	0.26	0.20	0.20
Center City	0.62	0.35	0.49
CBD	1.00	0.85	0.93

The average value was used for materials, energy and pollution factors calculations.

Table 9 Busway Capital Cost per Lane Mile by City Size and Construction Type (millions of 1976 $)

	Construction Type				
	Aerial	At Grade	Cut and Cover	Cut and Cover[a]	Land[b]
Population > 1 million[c]					
Suburban	9.6[d]	4.8	17.0[d,e]	20.2[d,e]	2.04
Center City	15.4[d]	6.2	24.1[d,e]	28.7[d,e]	2.29
CBD	22.3[d]	6.6	38.0[e]	45.4[e]	2.54
Population 500,000 to 1 million[c]					
Suburban	9.0[d]	3.8	16.4[d]	19.6[d]	1.47
Center City	14.8[d]	4.8	23.5[d]	28.1[d]	1.72
CBD	22.1[d]	6.0	37.8	45.2	2.30
Population 100,000 to 250,000[c]					
Suburban	8.7[d]	3.2	16.1[d]	19.3[d]	1.15
Center City	14.3[d]	3.7	23.0[d]	27.6[d]	1.24
CBD	21.2[d]	4.9	36.8	44.2	1.37
Station Frequency[f]					
Suburban	0.5	1.0	0.5	0.5	N/A
Center City	1.0	2.0	1.0	1.0	N/A
CBD	2.0	4.0	2.0	2.0	N/A

Source: Ref. 23.

[a]Cut and cover with Mezzanine Subway.

[b]Land cost portion of total cost.

[c]Population ranges show assumptions for proration of land cost.

[d]Estimated.

[e]Values represent facilities with 2.5 stations per mile with half of the stations along and half off the main alignment.

[f]Number per mile.

2.2.1.3 Commuter Rail

Commuter-rail factors were based on double tracking an existing single track, at-grade commercial line. Right-of-way separation for commercial facilities is generally achieved through use of embankments and underpasses. Hence, the commuter rail bill of materials includes the materials for rehabilitating an existing roadbed, constructing a new roadbed, and rebuilding embankments and bridges to accommodate the additional track. Materials for a new electrification system are also included.

2.2.1.4 Highway

Highway factors were based on new construction of a standard six-lane freeway with a median strip. Shoulder and exit ramp pavement is estimated to be one-half the area of the traffic lanes. Highway bridge materials are derived from average estimates for a six-lane bridge over a four-lane road. A freeway overpass and underpass are assumed to require the same amounts of materials within the accuracy of this estimate.

2.2.1.5 Busway

Busway bill-of-materials factors are based on an average express busway located in the median of an existing freeway. The design provides for two 12-ft-wide bus lanes, a 8-ft shoulder on each side, and a one-ft median. A 110-yd aerial section was included in the factors for each route-mile to account for special ramps and overpass reconstruction.

2.2.2 Capital Cost

Capital costs per route- or lane-mile by type of construction and location class are presented for each of the five facility types. In addition, for light rail, rapid rail, highway and busway, the capital-cost factors were adjusted for land values in the three location classes (CBD, urban, suburban) based on available data.

Capital-cost factors include the cost of the route, the cost of land, and the prorated cost of stations (or, in the case of highways, the cost of bridges and overpasses). The station costs were prorated on the basis of representative station (bridge) frequencies in each location class. The station cost factors and frequencies used for this proration are shown below each of the capital cost tables.

2.2.3 Bills of Materials

Bills of materials per route- or lane-mile by type of construction and location class are presented for each of the five facility types. Distinction between location classes was made by adding prorated station construction materials to the guideway bill of materials for each type of construction. Station (bridge) construction materials were prorated on the basis of the representative station frequencies reported with the capital-cost table of each system type. The excavation volume (in cubic yards) and the portion of diesel fuel, gasoline, and electricity required for construction tasks (in million Btu) are also reported to aid in system comparisons.

2.2.4 Energy Use

Energy use per route- or land-mile by fuel type, type of construction and location class are presented for each of the five facility types. Energy-use factors include the energy required to obtain raw materials, manufacture components, and construct the guideways and stations.

2.2.5 Air Residuals

Air residuals per route- or lane-mile are presented by residual type, type of construction, and location class for each of the five facility types. Air-residual factors include the residuals resulting from raw material production, component manufacturing, and guideway and station construction, except those for generation of purchased electricity.

2.2.6 Water Residuals

Water residuals per route- or lane-mile are presented by residual type, type of construction, and location class for each of the five facility types. Industry-wide estimates of residual levels per unit of each material were estimated from development documents from U.S. EPA, detailing industry residuals by industrial point-source category.

The following approach was used in estimating water residuals from the production of each material.

1. The residual levels associated with the application of "Best Practicable Technology" (BPT) were obtained for both regulated and nonregulated residuals.
2. Residuals associated with mining or raw material production and manufacturing of the construction material were treated separately.
3. The portion of each industry that is presently operating with residual levels below the BPT standard was determined and the average residual levels for that segment were calculated.
4. The average residual level for each industrial segment not presently operating within the BPT standard was assumed to be the BPT standard.
5. An average residual level per unit of each material was calculated from steps 3 and 4.

Although data on nonregulated residuals were available for all of the materials analyzed, the information necessary for determining residual levels per unit of product and averages for the industry was generally not given in the sources reviewed. Hence, the reported residuals represent all those for which reasonably reliable industry-wide factors could be determined.

Estimates for mining and manufacturing processes were estimated separately, making separate reporting possible. No estimates of potential water residuals from on-site construction activities were made due to lack of data.

2.3 QUESTIONABLE DATA

2.3.1 Asphalt

Estimates obtained for the energy required to produce a ton of asphalt differed by up to a factor of five. A correct production value is difficult to define due to the complexity of the refining industry and the potential use of asphalt as a fuel, as well as a binder. A high value for asphalt production, not including the energy content of the asphalt, was used in this study. Inclusion of the energy lost by using asphalt as a binder instead of a fuel would increase even this high figure by a factor of ten.

In the absence of published data, a surrogate fuel breakdown for asphalt was derived from a combination of sources on extraction, refining, and transportation of petroleum products. The accuracy of this estimated fuel split could not be determined. Air residuals from asphalt production were derived by a similar technique and, hence, exhibit the same questionable accuracy.

2.3.2 Aggregates

The fuel breakdown for aggregate quarrying was estimated from published data on aggregate processing. Aggregate processing uses primarily diesel and gasoline fuels. The quarrying operation involves a substantial amount of drilling and blasting, requiring energy in the form of purchased electricity and explosives; considering all the energy to be for petroleum use for this operation (derived from aggregate processing data) results in an overestimate by an undeterminable amount. Quarry operations represent approximately one-third of aggregate production energy consumption according to published sources.

2.3.3 Excavation

Excavation energy efficiencies are a primary source of the difference in energy requirements for construction in the different location classes. However, published estimates differ widely on expected effects of urban settings on excavation energy efficiency. For example, the Transportation Research Board (TRB) of the National Research Council estimates 70,000 Btu/yd^3 in nonurban locations,[25] whereas a study of 28 California freeway projects stated excavation efficiencies ranging from 35,000-70,000 Btu/yd^3 for those in urban locations. Reconciliation of these estimates was not possible in the time allotted. For the purposes of this effort, reasonable excavation efficiencies were estimated at 35,000 Btu/yd^3 for suburban, 70,000 Btu/yd^3 for center city, and 105,000 Btu/yd^3 for the CBD.

Limited and disparate data were available on the excavation requirements of transportation facilities. A mean value for federally funded California freeway construction was reported as 9 yd^3 excavated/yd^2 pavement, including shoulders. This value appeared excessive. Subsequently, several California Department of Transportation (CALTRANS) engineers were contacted directly and values for typical structures obtained. These data were used in

the study and are shown in Table 10. The reasons for the apparent difference between mean and disaggregated values are not known. Subway excavation volumes were estimated from structure cross sections and are expected to exhibit fairly high accuracy.

2.3.4 Rail Construction Processes

The energy intensities of rail facility construction tasks were not found in the published literature. In place of direct estimates, energy factors for highway construction tasks were used for each analogous rail construction task. Typical examples of such surrogates are the use of highway aggregate subgrade hauling and grading energy factors for railway stone ballast laying and the use of highway bridge construction factors for elevated rail construction. On the surface, errors introduced by these analogies would appear to be within reasonable limits. However, differences in the width and accessibility of the right-of-way, as well as use of prefabricated elements and the special equipment they require, could result in substantially different energy intensities and fuel distributions.

Tunnel construction energies could not be derived by analogy from any highway construction task. Discussion with tunneling contractors indicated that excavation fuel use might be roughly 50% electric, 50% diesel. Tunnel structural component assembly energy was assumed to be equivalent to bridge construction for concrete elements and 36% of manufacturing energy for steel components.* Fuel distribution for tunnel structural component assembly was assumed to be 50% electric, 25% diesel, and 25% gasoline. Results of calculations using these assumptions should be treated as indicative rather than definitive.

Table 10 Evacuation Factors for Rail, Highway, and Busway Construction

Facility	Structure	Excavation Factor (yd^3 Excavated/ yd^2 Facility Structure)
Rail	Aerial	0.1
	At Grade	1.0
Highway	Aerial	0.1
	At Grade	2.5
	Open Cut	10.5
Busway	Aerial	0.1
	At Grade	2.0

*The 36% factor is the derived ratio of fabrication energy to materials manufacturing energy for automobile manufacturing. It is used here as an approximation of fabrication/manufacturing energy relationship for metallic components.

2.3.5 Busway Bill of Materials

Due to the common practice of placing express busways in existing freeway medians, substantial rebuilding of overpasses may be required to allow for the busway and to provide exclusive bus exit and entrance ramps. Of the two existing median-located express busways, one required limited overpass reconstruction, whereas the other involved extensive right-of-way rebuilding, including relocation of sections of a rail line. For the purposes of this analysis, a quantity of materials equivalent to one-half of a six-lane freeway overpass was included per route-mile of busway. This value is an approximation based on the capital cost estimates obtained for the busway and expected breakdown of these costs for excavation, paving and right-of-way improvements.

2.4 DISCUSSION

2.4.1 Rail Transit Systems

The majority of energy data presented in the analysis for rail transit was derived indirectly from highway and general construction indexes. In addition, the number of materials included in the analysis was limited by the necessity to use standard structural designs in computing materials volumes. In the course of data collection and analysis, it was learned that data of the type required for a more detailed analysis were available from certain contract and federal accounting forms. However, these construction contract data were not obtainable within the time constraints of this analysis. Therefore, neither the accuracy of the indirect derivation described above nor the comprehensiveness of the materials list could be verified from actual contract data.

2.4.2 Busways

It is expected from reviewing present busway experience that all results presented in this analysis could have considerable variance in either direction depending on the location and amenities specified for the busway analyzed.

3 VEHICLE PRODUCTION

This section presents the method used to estimate the energy use by fuel type and air and water residuals and solid wastes generated for materials extraction, processing and vehicle assembly on a per-vehicle basis for each vehicle characterized in the companion volume.[26] Figure B.1 in Appendix B displays the level of detail involved in this estimation. This flow diagram traces the expected steps in the production and use of materials from mining of raw materials to manufacture of vehicular components including appropriate recycling loops. The numerical values for the energy used for each vehicle are also found in Appendix B, together with the computer program used to derive these values.

3.1 METHODOLOGY

3.1.1 Vehicle Materials

The literature was first examined to determine the potential material content of conventional and advanced vehicles.* From this search was derived a list of materials that was thought to contain the materials making up 90-95% of the vehicle weight.

Next, literature pertaining to material energy content and the residuals from mining and refining operations was located. Data were compiled according to material type and compared to obtain values supported by the majority of references. Because many of the references treated only the energy content of the material, i.e., Btu/unit material, reconciliation of reference data was made, where possible, using this measure. In general, distributions by fuel type, when found, were in closer agreement than estimates of the energy content of the material itself. Reconciliations were accomplished, where possible, by converting all data to a common measurement base and correcting for varying beginning and end points of the data analyses. For instance, some references began their analyses at the input to the refinery and ended with mill output, whereas others began at the mine and ended at the production of a semifinished product. Other reference data were products of studies made at different times. Plotting of the adjusted data tended to show definite clustering of values for some materials. An average of these values was then taken as the most likely energy content. For data where no rational reconciliation was possible, judgment was used to assign a likely value. For the most part, these assignments were based on the data given by references that exhibited the most complete and understandable treatment of the subject. Similar procedures were used to select most material fuel distributions and residuals.

Because energy content by fuel and the residuals of a material product are very different for primary and recycling processes, data for both were included where found.

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*References for Sec. 3 are: 4, 9, and 27-53.

3.1.2 Recycling and Import Assumptions

Material energy contents by fuel and fuel-production residuals are scenario sensitive. Energy and residuals credited to the U.S. over time and scenario depend on mining sites (U.S. or non-U.S.), and refining operation efficiency gains/losses. In addition, they strongly depend on the degree of recycling (in general, recycled material expends about 20% or less of primary material energy), and the amount of semifabricated material purchased from foreign countries. For materials in the last category, no energy or residuals are credited to the U.S., but the U.S. balance of payments may be adversely affected.

Consideration of these four scenario-sensitive factors led to the necessity to obtain or estimate, where possible and feasible, energy data for each of the following material production stages: (a) mining, (b) beneficiation (unless included in mining), (c) refining, (d) semifabrication, and (e) final fabrication. These stages may also be defined as (a) ore preparation, (b) manufacture of ingot/pig material or casting -- if poured directly from the furnace, (c) manufacture of sheet/wire/plate or other basic material forms purchased by the vehicle industry, and (d) forming/stamping/machining or other processes performed by the industry in the assembly of a vehicle.

In many cases, production energy estimates for each of the above were derived from reference data and engineering judgment. Recycling and import percentages were incorporated in the analysis according to the reference data along with reference-derived or estimated energy by stage so that the total energy over the process agreed with the reconciled data, by fuel per pound of material, reflecting all scenario and time-dependent factors.

3.1.3 Fuel Supply Assumptions

Energy distributions by fuel type are also scenario sensitive because the scenarios place varying emphases on the kinds of fuels used and also imply future major fuel-distribution changes. For instance, the environmentally sensitive socioeconomic society resulting in Technology Set B* tends to suppress the continued development of nuclear power and to favor renewable resources. Energy data for materials were then multiplied by the appropriate percent distribution of fuel types. These results are presented in Table 11.

As noted, reference residuals data (air and water) were also divided into those associated with primary and secondary (where applicable) materials manufacture and converted into pounds per million pounds-material units. Further disaggregation of these data into material production stages matching those used in the energy computation would be desirable but was not possible in the allotted time. However, gross allocations of air and water residuals to mining and manufacturing processes were made according to data given by the references. It is not expected that the percentage of ores mined in the U.S. will change markedly in any scenario, except for a possible slight increase of domestic bauxite occurring in the dynamic society resulting in Technology Set A.* Thus, the reference residual data (usually already adjusted for U.S./non-U.S. mining and manufacture) is a reasonable approximation over time and

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*The technology sets are defined in Ref. 26.

Table 11 Energy per Pound of Material by Energy Type, Material, Year, and Technology Set

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
Cold Rolled Steel							
1980		8,301	772	3,186	6,165	-	18,423
1990	A	5,852	571	2,614	4,826	-	13,863
	B	6,753	660	3,037	5,531	-	15,982
	C	7,919	733	2,992	5,809	-	17,453
2000	A	5,567	551	2,589	4,822	-	13,529
	B	5,921	593	2,859	5,476	-	14,849
	C	7,741	702	2,727	5,204	-	16,373
Stainless Steel							
1980		14,598	1,286	4,640	8,317	-	28,841
1990	A	11,284	1,005	3,737	7,290	-	23,317
	B	11,630	1,070	4,315	8,260	-	25,275
	C	13,611	1,186	4,153	7,081	-	26,031
2000	A	10,751	964	3,651	7,270	-	22,636
	B	10,895	1,020	4,279	7,873	-	24,067
	C	12,147	1,059	3,705	6,294	-	23,204
Cast Iron							
1980		5,326	444	2,067	811	199	8,848
1990	A	5,078	210	1,622	821	198	7,929
	B	4,978	266	1,812	1,034	253	8,343
	C	5,206	338	1,734	715	163	8,157
2000	A	5,157	148	1,209	935	202	7,651
	B	5,010	147	1,333	1,169	251	7,909
	C	5,110	306	1,325	607	117	7,466
Nodular Iron							
1980		7,345	612	2,907	1,157	294	12,315
1990	A	6,980	290	2,282	1,175	293	11,021
	B	6,894	369	2,570	1,490	373	11,696
	C	7,181	467	2,435	1,018	241	11,342
2000	A	7,086	205	1,703	1,338	299	10,631
	B	6,925	206	1,887	1,687	370	11,075
	C	7,014	420	1,851	858	173	10,316

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Hydro-Electricity	Other	Total
Malleable Iron								
1980		8,144	678	3,239	1,294	-	332	13,687
1990	A	7,734	322	2,544	1,316	-	330	12,246
	B	7,851	410	2,870	1,671	-	421	13,023
	C	7,963	517	2,713	1,138	-	272	12,064
2000	A	7,849	228	1,899	1,498	-	337	11,811
	B	7,683	230	2,107	1,892	-	418	12,329
	C	7,768	465	2,059	958	-	195	11,444
Copper								
1980		21,266	7,321	4,857	14,408	-	35	47,887
1990	A	21,610	4,288	3,733	14,542	-	56	44,228
	B	18,706	4,924	4,630	14,060	-	90	42,409
	C	17,789	6,033	4,033	12,155	-	31	40,041
2000	A	23,745	3,010	3,166	15,241	-	70	45,231
	B	17,522	3,886	4,285	13,491	-	127	39,310
	C	18,388	5,441	3,729	12,451	-	31	40,041
Aluminum								
1980		1,700	2,138	26,380	33,837	10,835	175	75,065
1990	A	2,900	1,477	20,346	30,212	7,590	177	62,701
	B	1,946	1,163	19,020	28,949	6,603	205	57,885
	C	2,558	1,909	30,716	38,258	11,396	133	84,969
2000	A	3,847	1,141	17,505	30,341	5,663	197	58,694
	B	2,650	825	15,761	26,687	5,306	201	51,430
	C	2,971	1,682	28,780	36,937	10,235	126	80,731
Lead								
1980		2,545	187	2,086	5,621	-	1,139	11,578
1990	A	2,624	75	1,432	5,000	-	1,018	10,149
	B	2,284	161	1,623	5,056	-	1,037	10,162
	C	2,561	182	1,793	5,568	-	1,101	11,205
2000	A	2,849	75	1,021	5,186	-	1,018	10,149
	B	2,351	101	1,504	5,146	-	1,048	10,149
	C	2,492	100	1,890	5,283	-	1,062	10,826

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
Zinc							
1980		8,551	42	13,276	8,175	138	30,182
1990	A	9,018	36	9,926	7,983	120	27,083
	B	6,901	26	9,840	9,045	86	25,898
	C	7,857	37	11,300	6,930	124	26,248
2000	A	9,899	37	8,926	8,447	122	27,430
	B	7,295	23	8,296	9,277	77	24,917
	C	8,186	36	10,863	7,088	121	26,294
Nickel							
1980		2,477	363	7,174	7,937	-	17,951
1990	A	4,032	348	5,942	7,672	-	17,994
	B	3,118	292	7,220	8,166	-	18,797
	C	2,441	283	6,314	7,212	-	16,249
2000	A	4,798	341	5,310	7,686	-	18,134
	B	3,885	264	6,703	8,460	-	19,312
	C	2,831	285	6,016	7,253	-	16,384
Titanium							
1980		1,900	12,026	6,937	117,487	40,871	179,797
1990	A	1,785	10,712	6,152	100,288	34,740	153,677
	B	1,560	8,118	4,973	76,526	26,330	117,507
	C	1,710	11,342	6,243	105,738	36,784	161,817
2000	A	1,760	9,551	5,738	89,842	30,976	137,867
	B	1,470	7,163	4,528	67,757	23,232	104,150
	C	1,652	10,530	5,894	98,332	34,151	150,559
Tires							
1980		6,956	10,494	14,232	11,045	-	42,728
1990	A	7,503	9,098	12,536	11,148	-	40,285
	B	5,368	7,521	10,254	11,532	-	34,674
	C	5,565	8,394	11,385	8,890	-	34,324
2000	A	9,910	7,248	10,514	11,057	-	38,729
	B	5,403	6,112	8,473	11,856	-	31,844
	C	5,592	8,436	11,442	9,194	-	34,664

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
Cobalt							
1980		16,240	5,858	-	6,902	-	29,000
1990	A	15,570	3,425	-	6,955	-	25,950
	B	15,390	4,320	-	7,290	-	27,000
	C	14,750	5,321	-	6,269	-	26,340
2000	A	15,372	2,196	-	6,832	-	24,400
	B	14,436	3,485	-	6,969	-	24,890
	C	15,014	4,799	-	6,532	-	26,340
Plastics							
1980		-	13,116	32,938	3,577	-	49,680
1990	A	-	12,735	31,983	3,473	-	48,240
	B	-	13,321	33,455	3,633	-	50,460
	C	-	13,274	33,336	3,620	-	50,280
2000	A	-	12,704	31,904	3,465	-	48,120
	B	-	13,591	34,131	3,707	-	51,480
	C	-	13,464	33,813	3,672	-	51,000
Sodium							
1980		4,416	184	-	40,940	460	46,000
1990	A	4,032	168	-	37,380	420	42,000
	B	4,181	174	-	38,760	436	43,550
	C	4,239	177	-	39,302	442	44,160
2000	A	3,974	166	-	36,846	414	41,400
	B	4,063	169	-	37,665	423	42,320
	C	4,063	169	-	37,665	423	42,320
Paint							
1980		1,582	1,246	2,709	1,463	-	7,000
1990	A	1,469	1,157	2,516	1,359	-	6,500
	B	1,530	1,205	2,620	1,415	-	6,770
	C	1,539	1,212	2,635	1,423	-	6,810
2000	A	1,469	1,157	2,516	1,359	-	6,500
	B	1,503	1,184	2,574	1,390	-	6,650
	C	1,519	1,196	2,601	1,407	-	6,720
H_2SO_4							
All		-	-	19	NEG	1	20

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
Carbon/Graphite							
	All	-	196	396	406	-	1,000
Ceramics							
1980		10,400	2,400	23,200	4,000	-	40,000
1990	A	15,200	1,600	19,200	4,000	-	40,000
	B	9,600	2,000	22,400	6,000	-	40,000
	C	10,000	2,400	23,600	4,000	-	40,000
2000	A	16,800	1,200	18,000	4,000	-	40,000
	B	10,400	1,600	20,000	8,000	-	40,000
	C	12,000	2,000	22,000	4,000	-	40,000
Glass							
1980		196	1,617	6,664	1,078	245	9,800
1990	A	465	1,256	5,952	1,395	233	9,300
	B	282	1,551	6,204	1,128	235	9,400
	C	241	1,637	6,452	1,059	241	9,630
2000	A	900	765	4,860	2,250	225	9,000
	B	322	1,472	5,980	1,196	230	9,200
	C	285	1,568	6,318	1,093	238	9,500
Sound Deadeners							
1980		126	1,596	1,218	1,113	2,954	7,000
1990	A	637	962	806	1,164	2,932	6,500
	B	54	1,205	975	1,076	3,459	6,770
	C	191	1,485	1,049	1,083	3,010	6,810
2000	A	897	702	650	1,235	3,016	6,500
	B	53	851	665	1,057	4,023	6,650
	C	255	1,398	968	1,068	3,037	6,720
Lithium							
1980							197,800
1990	A						178,000
	B						185,930
	C						189,890
			Distribution not determined				
2000	A						168,150
	B						174,060
	C						181,970

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
Li_2S							
1980							63,000
1990	A						56,700
	B						59,220
	C						60,480
			Distribution Not Determined				
2000	A						53,550
	B						55,440
	C						57,960
LiCL							
1980							36,400
1990	A						32,760
	B						34,220
	C						34,940
			Distribution Not Determined				
2000	A						30,940
	B						32,030
	C						33,490
KOH/KCl							
1980							4,590
1990	A						4,330
	B						4,400
	C						4,470
			Distribution Not Determined				
2000	A						4,210
	B						4,310
	C						4,400
Silicon							
1980							46,850
1990	A						41,900
	B						43,750
	C						45,600
			Distribution Not Determined				
2000	A						39,500
	B						41,900
	C						44,370
Sulfur							
	All		Distribution Not Determined				443

Table 11 (Cont'd)

Material Year	Technology Set	Energy Type (Btu/lb Material) Coal	Petroleum	Natural Gas	Purchased Electricity	Other	Total
ZnCl							
	All	Distribution Not Determined					18,600
Veh. Fab.							
1980		1,478	416	3,359	1,346	-	6,600
1990	A	2,167	334	2,514	1,285	-	6,300
	B	1,837	408	2,905	1,320	-	6,470
	C	1,408	415	3,415	1,342	-	6,580
2000	A	2,505	267	2,164	1,265	-	6,200
	B	2,304	335	2,399	1,291	-	6,330
	C	1,643	408	3,099	1,320	-	6,470
Magnesium							
	All	-	537	65,156	100,061	13,246	179,000

scenario changes. No residuals data for the semifabrication stage of manufacture were found. It was assumed that these residuals are primarily thermal and thus not accounted for.

The following assumptions of residual control for each TAPCUT technology set were made:

All Sets: 1980 - Air, as shown, and BPT Water

Technology Set A: 1990 - Air, as shown, and BPT Water
2000 - Air, as shown, and BAT* Water

Technology Set B: 1990 - Air, as shown, and BAT Water
2000 - Air, as shown, and BAT Water

Technology Set C: 1990 - Air, as shown, and BPT Water
2000 - Air, as shown, and BPT Water

It is recognized that the above assumptions are gross and imply that no detailed changes in residual control regulation nor technology will occur as a function of scenario. However, the data were, in many cases, disparate and thus the accuracy of the values finally used is such that detailed changes with respect to time and scenario would be within the error bounds of the base data. Consideration was also given to multiplying each air and water residual by a constant percentage in order to more accurately reflect the mood of the scenarios. However, this method was rejected in favor of the former method because a constant percentage multiplier may unduly distort the projection

*Best available technology.

(i.e., possibly only one or two residuals would really be affected in a major way).

Having derived a distribution of fuels and residuals as a function of material, time and scenario in terms of Btu and pound-residuals per pound-material, the next step was to estimate bills of materials for each major vehicle component as a function of vehicle kind, time, and scenario. The rationale and lists of bills of materials used in this study are given Ref. 26.

A computer program was written to compute the actual bill of fuels and residuals associated with the construction of each TAPCUT vehicle. As mentioned before, the program and its results are presented in Appendix B.

3.2 RESULTS

3.2.1 Assumptions

Data for 1975 from the literature were projected to 1980, 1985, 1990, and 2000 according to interpretations of the technological thrusts of the TAPCUT scenarios. However, later in this work, it was decided that a base year of 1980 would be a more logical starting point. In reviewing the projections given in the tables, it was found that the variance between scenario projections was, with the exception of aluminum in Technology Set C, small for the 1975-1980 interval. Therefore, it was arbitrarily decided to use Technology Set A values as representative of the 1980 experience for all technology sets. These values were used in the program. The distribution of materials projections, described above, were also entered into the program and the per-vehicle results computed.

3.2.2 Questionable Data

According to the references that assessed the potential accuracy of their findings, ±30% or more potential error was common. Other references, particularly those dealing with the energy associated with the aluminum production cycle, noted ranges varying about 20% from low to high values. The actual values depend on the process path. This work used averages in all computations and therefore has, at best, confidence level ranges no less than the reference data.

It appears that the energy/lb of nickel as given by Ref. 46 is high due to the preponderance of imports. Reference 29 gives the total energy from mine to primary metal as 72,000 Btu/lb. Therefore, assuming 90% imports, the U.S. energy credit should be in the region of 7000-8000 Btu/lb instead of the 44,900 Btu/lb given by Ref. 46. Because nickel may become an important constituent of battery vehicles, this disparity is important.

Zinc data is especially suspect because the few references found were so disparate that no rational reconciliation could be made. Engineering judgment was used in selecting an energy value for use in this study, but the value chosen is not supportable by empirical data. The weakness in zinc data is carried through into the estimate of energy data for zinc/chloride because

the production energy of this compound was estimated from the atomic weights of its constituents and their production energies.

Titanium data are considered weak for both total energy value and the related fuel distribution by type of fuel. The unusually large percentage of fuels listed in an "other" category by the references illustrates this fact. Lithium data is questionable because the "proprietary" nature of the process prevented an adequate analysis to be made by the authors of the references.

Ceramics energy and residuals data were based on high-fired porcelain insulator technology. It is not known how well these data approximate the true data for the silicon nitride materials that may be used in future Stirling and Brayton cycle engines.

According to one reference, cobalt is thought to have energy and residuals values like those of copper. How well this approximation holds is unknown.

3.3 DISCUSSION

The mass of data resulting from the vehicle-production analysis is not in a form that lends itself to ready discernment of trends or demonstration that the analysis is internally consistent. Therefore, three analyses are presented here to illustrate not only the results, but also the complex interaction of the time-variant factors in their computation.

First, the total specific energy required to produce the medium-sized Otto-engine automobiles over time and technology set is shown in Fig. 6. The projected changes in vehicle bills of materials, and society-directed shifts in manufacturing policies must be known for each scenario/technology-set in order to understand the somewhat surprising trends indicated in the figure. The projected bills of materials for the year 2000 taken from Ref. 26 show light materials (aluminum, plastics, and magnesium) increasing in Otto engines from 8.5% to 52% for Technology Set A, to 54% for Set B, and to 35% for Set C. The use of lighter materials in bodies (aluminum, plastics, and carbon/graphite composites) follows the same pattern, increasing to 22% for Technology Sets A and B, and to 15% for Set C from 8.3% in the 1980 base year.

For the scenario leading to Technology Set A, it was interpreted that a major thrust of socioeconomic conditions and government policies would be to increase exports and to initially relax environmental control on manufacturing in favor of energy efficiency gains. Production processes were seen to be greatly improved, and the improved processes quickly replaced outmoded ones. Imports of ores and fabricated materials were estimated to be reduced, and recycling was expected to increase moderately over 1980 levels. The use of purchased electricity for materials processing and plant operation was seen to rise as it was substituted for petroleum where possible.

A primary effect of socioeconomic conditions on the material content of Technology Set B products was interpreted to result in sharply increased proportions of recycled materials. In general, the conservation ethic would

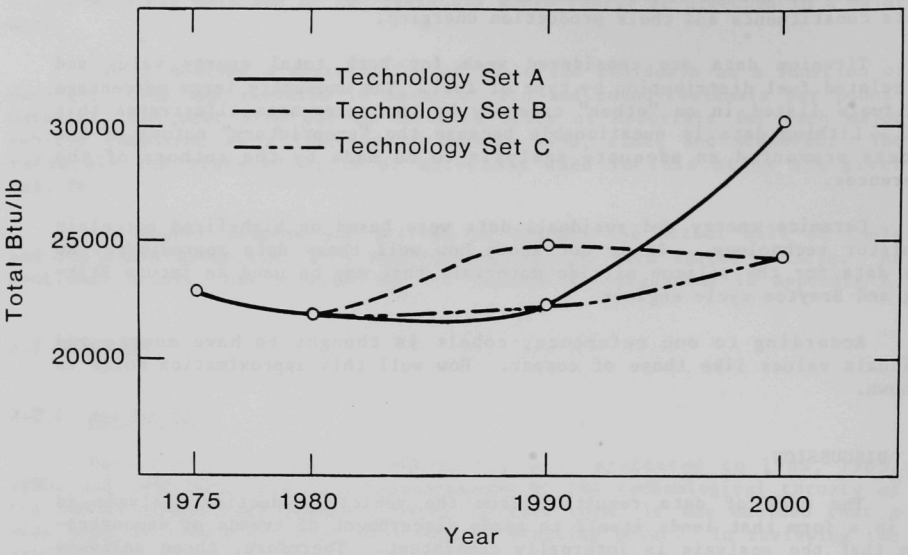

Fig. 6 Comparison of Total Weight-Specific Vehicle Production Energy for a Medium-Sized Automobile with an Otto Engine

result in reduced requirements for products and energy, and some ores would be imported to reduce environmental degradation. Strict environmental controls were projected to be retained, but plant productivity would show some improvement, despite controls, and there would be a moderate amount of new plant construction. Purchased electricity use would rise because of its environmental benefits; the electricity would be generated by natural gas and coal-derived fuels.

In Technology Set C, little improvement was projected in the conservation of either energy or the environment. Lack of environmental control enforcement would result in some transitory increases in plant productivity. However, few new plants were projected to be constructed and the faltering economy inherent in the scenario required increasing material imports. The amount of recyling was also decreased. Little change in the 1980 distribution of fuels was projected.

With this background, the results of Fig. 6 may be interpreted as follows:

a. In Technology Set A, production energy use per pound of vehicle dips slightly between 1980 and 1990 as lighter vehicles are produced and plant efficiency improves. However, energy use rises sharply from 1990 to 2000 as more energy-intensive materials, such as aluminum and magnesium, are substituted and material imports reduced to gain a favorable balance of trade. (Recall that

only those fuels used and residuals produced within the continental U.S. are counted in this analysis. Thus, reducing imports increases specific energy use.)

b. Technology Set B, with its emphasis on conservation and environment, is level between 1980 and 1990 even though plant efficiencies increase marginally and substitution of energy-intensive materials is instituted at an earlier date. A large projected increase in recycling is the major reason for energy saving. However, increased use of light materials causes a slight rise in total energy from 1990 to 2000. Manufacturers' reduced vehicle operating energy use (the greatest energy expenditure) and, as a result, incurred some increased energy use in production.

c. For Technology Set C, increased energy use after 1980 occurs as small-plant-efficiency increases are offset by productivity decreases. However, the situation is turned around after 1990, when substitution of energy-intensive materials has not been aggressively pursued and increasing material imports shift the energy expenditure and residuals burden outside the U.S.

The result of this analysis for the year 2000 is that the domestic energy use per pound of vehicle in the rather poorly organized social climate of Technology Set C is coincidentally the same as that expended by the environmentally focused society of Set B. The primary cause is that in Technology Set C, the favorable energy expenditure was at the expense of unfavorable trade balances, whereas Set B gained it through recycling. On the other hand, the society of Technology Set A willingly expended larger amounts of energy to gain a large measure of raw material independence and assume an exporting role.

The second analysis goes a level deeper. Figure 7 shows the specific purchased electrical energy vs. year for Technology Sets A and C combined with plots showing the vehicle curb weight fraction of light metals for those sets. The comparison of specific-energy expenditure with the percent light-metal content in a vehicle is only approximate in this analysis because the specific electrical energy values include other expenditures than for the production of light metals. However, light-metal (i.e., aluminum and magnesium) production accounts for much of the electrical energy expended in producing a vehicle and thus can provide a way to compare the efficiency of that expenditure with regard to Technology Sets.

Reference 26 provides the information necessary to derive the data set shown in Table 12 for a large, Otto-engined automobile. The plots of Fig. 7 are taken from these data. The positive inflection of the Technology Set A specific·electrical-energy-use curve at 1990 is counter to the intuition that that curve and the Set A percent of light metal curve should be smoothly related. The electrical fraction of energy expended to reprocess aluminum in the U.S. is projected to increase in the 1990-2000 time period concurrent with a moderate projected increase in recycling. A general shift to the use of electrical process energy for most of the materials used in the 1990-2000

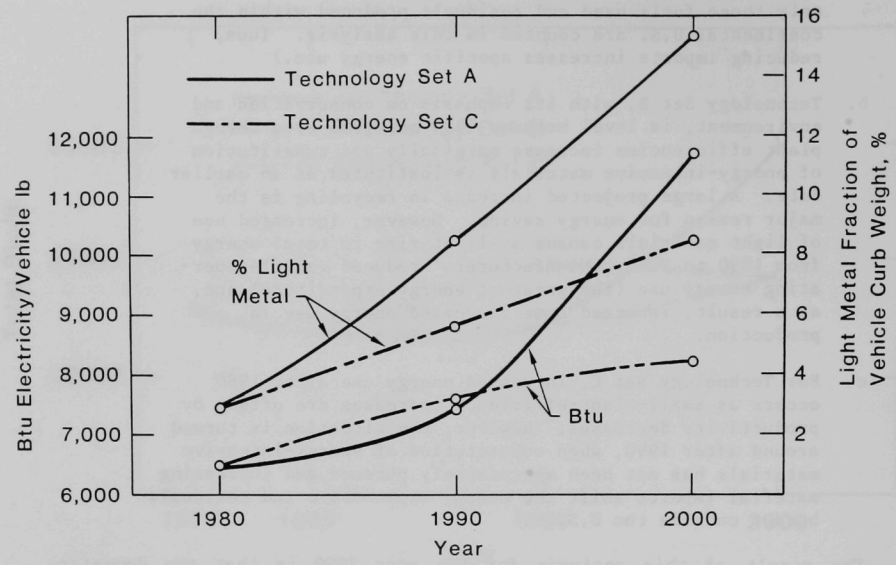

Fig. 7 Comparison of Weight-Specific Electrical Production Energy and Percent Light Metal Fraction of Curb Weight for a Large-Sized Automobile with an Otto Engine

Table 12 Use of Light Metals in Large Otto Vehicles in Technology Sets A and C

Year and Tech Set	Curb Wt. (lb)	Total Elec. (10^7 Btu/veh.)	Specific Elec. (Btu/vehicle lb)	Light Material (% curb wt.)
1980 A	3,702	2.38	6,440	2.9
1990 A	2,986	2.22	7,448	8.6
2000 A	2,640	3.09	11,705	15.3
1980 C	3,702	2.38	6,440	2.9
1990 C	3,125	2.36	7,539	5.7
2000 C	2,980	2.46	8,255	8.5

Set A vehicles is also projected. During this same time period, an increasing proportion of U.S. mined and processed aluminum is projected, thus correspondingly increasing the U.S. energy burden. Finally, the vehicle bills of materials reflect the projected introduction of highly electrical-energy-intensive magnesium into Otto engines by 2000. The sum of these observations rationalizes and explains the sudden increase of specific electrical energy use with respect to the percentage of light metals used in vehicular construction in Technology Set A. Technology Set B, on the other hand, results in curves that generally agree with intuitive expectations.

It is also possible to derive a measure of the productivity of the two societies with regards to the expenditure of electrical energy for the production of light metals. If the factor change in the percentage use of light metals in the vehicle over the years 1980 to 2000 is divided by the factor change in electrical energy use per pound-vehicle, an electrical energy "productivity index" results. For example, in Technology Set A, the factor change in the percentage of light metals is 5.28 (15.3%/2.9%). The factor change in electrical energy use is 1.82 (11,705/6,440 Btu per vehicle lb). The productivity index is then 2.91 (5.28/1.82). A similar computation for Technology Set C results in a productivity index of 2.29. Comparison of the two productivity indices shows that Technology Set A is roughly 27% more efficient than Set C in its utilization of electrical energy to produce light metals for automobiles. (Again, this result is approximate because the electrical energy values shown include a relatively small amount for the production of materials other than light metals.)

The third analysis compares the water Total Suspended Solids (TSS) residual burden experienced by the societal climates leading to Technology Sets A and C in units of pounds-TSS/vehicle lb (large-Otto-engine-vehicle). Figure 8 shows the results.

Among materials for which data are available, aluminum primary and secondary production results in high levels of TSS residual burden using best practicable technology, but these levels drop dramatically if the best available technology is applied. In Sec. 3.1 of this document, the assumption is given that both Technology Sets A and C would utilize BPT procedures through 1990, but that after 1990, Set A would institute BAT procedures. Appendix B shows the results of the residuals computation in terms of pounds residual per vehicle. From the input sections of those portions of Appendix B relating to large-Otto-engined automobiles for the technology sets and years of interest, vehicle curb weights may be computed and the TSS residual per pound of vehicle found.

From consideration of these data, the curves of Fig. 8 may be explained. From 1980 to 1990, Technology Set A increases the use of light metals (aluminum) from 2.9% to 8.6% whereas Set C increases aluminum use to 5.4%. Therefore, the higher lb-TSS/vehicle lb for Set A in 1990 is probably due to its more extensive use of aluminum. However, after 1990, Set A institutes BAT procedures and the value of lb-TSS/vehicle lb drops accordingly even though extensive use of light materials in vehicle construction is projected. Technology Set C, on the other hand, continues its upward path corresponding to its moderate increase in the use of light materials.

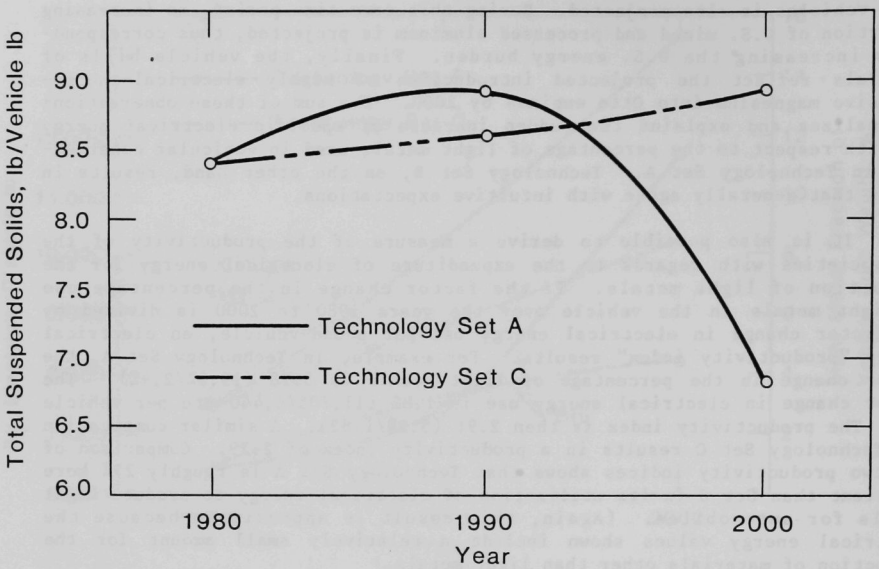

Fig. 8 Comparison of Pounds-Total Suspended Solids (TSS) per Vehicle Pound for a Large-Sized Automobile with an Otto Engine

The foregoing three examples are intended to show that the results of the fuels and residuals of vehicle production analysis are consistent with the basic assumptions concerning the technological thrusts of the three alternate societies as driven by their respective socioeconomic conditions, and that the consistency may be highlighted by the development of scenario performance measures derived from the projected raw data.

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APPENDIX A

INFRASTRUCTURE MATERIALS, ENERGY, AND RESIDUALS CHARACTERISTICS

Tables A.1-A.57 present the materials, energy, and residuals associated with infrastructure construction.

Table A.1 Light Rail Aerial Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
902.000	2451.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	15087.000	1516.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
25843.746	4185.004	17197.293	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
904.877	271.073	6364.434	4.215
8623.242	7326.305	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
131599.500	42731.461	18227.121	1886.208	24459.262
1465.163	28278.547	1854.473	11443.582	88365.312

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
6.416	15.139	2.315	67.144	3.745
186.516	0.0	0.0	0.0	186.516

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
95.640	16.741	13.756	2.658	27055.711
8.134	0.0	18.319	0.098	6266.441

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.256	17.098	10.686	6.233	0.0
0.079	0.0	0.0	0.0	1.603

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.028	47508.922	4.420
12.823	0.089	0.0	3.390	14.913

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	3.490
3.600	104.151	0.239	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.078	0.0	0.0	0.0
0.0	1323.575	3200.645	1564.225

Table A.2 Light Rail Aerial Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
902.000	2451.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	15087.000	1516.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
26210.594	4249.289	17457.297	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
921.615	276.087	6462.195	4.215
8702.383	7392.410	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
133994.875	43321.820	18553.777	1911.372	24780.977
1478.576	28537.250	1871.465	11547.195	89164.687

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
6.526	15.334	2.345	68.011	3.810
188.227	0.0	0.0	0.0	188.227

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
96.875	16.958	13.909	2.692	27553.855
8.208	0.0	18.539	0.099	6381.758

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.260	17.318	10.824	6.314	0.0
0.079	0.0	0.0	0.0	1.624

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.067	47941.562	4.420
12.989	0.090	0.0	3.390	15.049

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	3.522
3.600	105.099	0.241	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.078	0.0	0.0	0.0
0.0	1348.050	3259.830	1593.150

Table A.3 Light Rail Aerial C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
902.000	2451.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	15087.000	1516.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
26944.289	4377.855	17977.301	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
955.090	286.115	6657.715	4.215
8838.324	7515.027	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
138785.687	44502.539	19207.094	1961.700	25424.406
1502.695	28988.176	1900.871	11736.484	90630.062

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
6.745	15.725	2.405	69.745	3.940
191.168	0.0	0.0	0.0	191.168

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
99.345	17.390	14.202	2.759	28549.984
8.340	0.0	18.971	0.100	6612.367

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.266	17.760	11.100	6.475	0.0
0.081	0.0	0.0	0.0	1.665

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.145	48711.730	4.420
13.320	0.092	0.0	3.390	15.290

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	3.578
3.600	106.787	0.245	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.079	0.0	0.0	0.0
0.0	1397.000	3378.199	1651.000

Table A.4 Light Rail At-Grade Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
468.000	297.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
24.500	13717.000	21400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
11084.629	1411.785	6283.852	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
801.229	235.565	2171.968	4.215
4788.008	2884.004	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
176983.875	19680.023	2998.656	933.228	12433.055
655.844	14849.098	1001.272	4876.492	37045.539

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
1.436	7.956	1.217	35.287	0.749
103.562	0.0	0.0	0.0	103.562

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
50.263	8.798	12.440	1.532	3803.744
5.173	0.0	14.021	0.186	815.005

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.135	8.986	5.616	3.276	0.0
0.080	0.0	0.0	0.0	0.842

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	1.591	64012.613	4.420
6.739	0.047	0.0	3.390	17.253

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	4.703
3.600	153.782	0.283	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.104	0.0	0.0	0.0
0.0	163.350	395.010	193.050

Table A.5 Light Rail At-Grade Center City R.O.W. Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
468.000	297.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
24.500	13717.000	21400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
11288.645	1440.069	6410.355	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
805.865	236.953	2215.976	4.215
5162.266	3053.367	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
177667.250	20036.305	3096.992	949.596	12648.602
702.241	15969.426	1078.192	5187.699	39372.043

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
1.475	8.092	1.238	35.890	0.770
111.657	0.0	0.0	0.0	111.657

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
51.122	8.949	12.721	1.560	3945.977
5.450	0.0	14.294	0.189	846.778

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.137	9.139	5.712	3.332	0.0
0.083	0.0	0.0	0.0	0.857

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	1.618	65631.875	4.420
6.854	0.048	0.0	3.390	17.762

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	4.822
3.600	157.332	0.291	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.107	0.0	0.0	0.0
0.0	169.950	410.970	200.850

Table A.6 Light Rail At-Grade C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
468.000	297.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
24.500	13717.000	21400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
11696.676	1496.637	6663.363	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
815.136	239.729	2303.992	4.215
5586.777	3252.968	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
179034.000	20748.863	3293.664	982.332	13079.695
755.764	17245.578	1165.620	5550.043	42087.031

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
1.552	8.364	1.279	37.097	0.813
120.839	0.0	0.0	0.0	120.839

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
52.841	9.250	13.100	1.612	4228.062
5.768	0.0	14.715	0.193	910.040

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.142	9.446	5.904	3.444	0.0
0.086	0.0	0.0	0.0	0.886

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	1.673	67490.875	4.420
7.085	0.049	0.0	3.390	18.345

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	4.958
3.600	161.408	0.301	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.110	0.0	0.0	0.0
0.0	183.150	442.890	216.450

Table A.7 Light Rail Cut and Cover R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3891.000	9048.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	55666.000	237828.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
106299.312	16301.770	69418.000	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3300.781	988.821	25055.145	4.215
29811.598	26082.949	3975.360	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
484690.437	179628.500	67751.062	8035.051	104738.812
5148.891	98305.937	6429.250	40504.145	313154.562

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
24.474	65.254	9.980	289.423	14.137
644.807	0.0	0.0	0.0	644.807

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
412.255	72.164	54.003	11.325	98860.375
28.506	0.0	75.468	0.342	22898.305

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.105	73.699	46.062	26.869	0.0
0.276	0.0	0.0	0.0	6.909

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.051	166492.937	4.420
55.274	0.384	0.0	3.390	52.261

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	12.230
3.600	364.991	0.838	0.013	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.272	0.0	0.0	0.0
0.0	4830.371	11680.719	5708.621

Table A.8 Light Rail Cut and Cover Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3891.000	9048.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	55666.000	237828.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
108142.375	16649.297	70783.812	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3400.540	1018.706	25580.371	4.215
34180.645	28149.566	3975.360	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
498859.500	182502.562	69666.312	8153.672	106234.687
5701.172	111448.812	7329.348	44248.762	341222.375

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
25.100	66.147	10.117	293.381	14.513
739.307	0.0	0.0	0.0	739.307

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
417.893	73.151	56.981	11.539	101852.937
31.788	0.0	78.042	0.381	23588.520

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.121	74.707	46.692	27.237	0.0
0.307	0.0	0.0	0.0	7.004

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.229	185662.937	4.420
56.030	0.389	0.0	3.390	58.279

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	13.638
3.600	407.016	0.935	0.015	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.303	0.0	0.0	0.0
0.0	4976.395	12033.832	5881.195

Table A.9 Light Rail Cut and Cover R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3891.000	9048.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	55666.000	237828.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
111828.562	17344.348	73515.375	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3600.057	1078.476	26630.828	4.215
39573.371	30846.230	3975.360	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
527197.625	188250.687	73496.750	8390.910	109226.375
6400.242	127776.250	8443.840	49052.781	377347.062

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
26.351	67.932	10.390	301.298	15.266
855.948	0.0	0.0	0.0	855.948

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
429.170	75.125	61.047	11.916	107813.437
35.914	0.0	81.891	0.431	24966.012

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.151	76.723	47.952	27.972	0.0
0.347	0.0	0.0	0.0	7.193

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.586	209758.687	4.420
57.542	0.400	0.0	3.390	65.842

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	15.408
3.600	459.840	1.056	0.017	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.342	0.0	0.0	0.0
0.0	5268.445	12740.062	6226.344

Table A.10 Light Rail Rock Tunnel Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3947.000	4726.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	29078.000	111864.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
95831.187	12679.754	57667.207	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1676.559	502.249	19785.203	4.215
26597.086	18802.684	62615.012	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
260954.625	169477.250	38478.687	7885.270	104328.812
4039.218	84488.937	5628.770	30560.859	234030.750

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
15.931	66.206	10.126	293.645	8.736
575.279	0.0	0.0	0.0	575.279

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
418.269	73.217	50.322	11.374	50902.715
23.154	0.0	73.492	0.278	11788.543

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.122	74.774	46.734	27.261	0.0
0.224	0.0	0.0	0.0	7.010

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.241	135232.125	4.420
56.081	0.389	0.0	3.390	42.449

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	9.933
3.600	296.460	0.681	0.011	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.221	0.0	0.0	0.0
0.0	2453.275	5932.461	2899.325

Table A.11 Light Rail Rock Tunnel Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3947.000	4726.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	29078.000	111864.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
97674.250	13027.281	59032.988	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1776.318	532.134	20310.430	4.215
28285.043	19147.551	63867.711	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
275123.687	172351.312	40393.918	8003.891	105824.687
4230.016	89240.062	5965.633	31441.535	240270.062

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
16.557	67.099	10.262	297.604	9.112
611.789	0.0	0.0	0.0	611.789

HEAVY METALS	COPPER	SULFIDE	LEAD	SULFIDE
0.660	120.500	49.700		
0.0	0.0	0.0		

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
423.907	74.204	51.561	11.542	53872.641
24.191	0.0	74.870	0.290	12476.062

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.137	75.782	47.364	27.629	0.0
0.234	0.0	0.0	0.0	7.105

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.420	141287.375	4.420
56.837	0.395	0.0	3.390	44.349

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	10.378
3.600	309.734	0.711	0.011	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.231	0.0	0.0	0.0
0.0	2599.300	6285.574	3071.900

Table A.12 Light Rail Rock Tunnel C.B.D. R.O.W., Materials Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3947.000	4726.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	29078.000	111864.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
101360.437	13722.332	61764.551	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1975.835	591.904	21360.887	4.215
30667.605	19837.285	66373.062	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
303461.812	178099.437	44224.379	8241.129	108816.375
4518.508	96092.437	6445.988	32937.906	251137.187

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
17.808	68.884	10.535	305.521	9.865
663.322	0.0	0.0	0.0	663.322

HEAVY METALS	COPPER	SULFIDE	LEAD SULFIDE
	0.660	120.500	49.700
	0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
435.185	76.178	53.646	11.867	59807.387
25.757	0.0	77.354	0.309	13850.484

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.167	77.798	48.624	28.364	0.0
0.249	0.0	0.0	0.0	7.294

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	13.777	150438.812	4.420
58.349	0.405	0.0	3.390	47.222

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
	0.013	0.0	0.0	11.050
	3.600	329.797	0.758	0.012	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.245	0.0	0.0	0.0
0.0	2891.350	6991.805	3417.050

Table A.13 Light Rail Earth Tunnel Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
8980.000	2174.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	13380.000	105764.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
193319.937	21401.191	106500.500	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
755.524	226.332	34162.746	4.215
33774.504	32660.836	104773.625	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
170706.187	357679.062	31964.367	17230.676	230846.687
5408.680	113613.500	7358.559	49770.504	386362.000

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
19.764	148.708	22.743	659.561	9.530
730.523	0.0	0.0	0.0	730.523

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
939.481	164.453	98.911	25.179	25336.102
33.882	0.0	155.406	0.407	5866.332

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
2.519	167.952	104.970	61.232	0.0
0.328	0.0	0.0	0.0	15.745

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	29.741	197890.812	4.420
125.964	0.875	0.0	3.390	62.117

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	14.536
3.600	433.823	0.997	0.016	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.323	0.0	0.0	0.0
0.0	1105.225	2672.635	1306.175

Table A.14 Light Rail Earth Tunnel Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
8980.000	2174.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	13380.000	105764.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
198751.687	22063.449	109648.562	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
817.346	244.852	35208.469	4.215
35772.152	33567.043	107717.437	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
181004.562	367504.625	33569.355	17695.316	237030.750
5660.430	119595.000	7769.180	51434.348	398802.375

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
20.512	152.660	23.348	677.092	9.923
773.730	0.0	0.0	0.0	773.730

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
964.452	168.824	101.988	25.860	27246.855
35.363	0.0	159.846	0.424	6308.309

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
2.586	172.416	107.760	62.860	0.0
0.342	0.0	0.0	0.0	16.164

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	30.532	206540.500	4.420
129.312	0.898	0.0	3.390	64.832

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	15.171
3.600	452.785	1.040	0.017	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.337	0.0	0.0	0.0
0.0	1195.700	2891.420	1413.100

Table A.15 Light Rail Earth Tunnel C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
8980.000	2174.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	13380.000	105764.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
209615.187	23387.969	115944.750	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
940.989	281.892	37299.914	4.215
38835.086	35379.457	113605.000	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
201601.250	387155.812	36779.336	18624.598	249398.875
6076.547	129070.687	8408.922	54513.320	422170.750

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
22.007	160.565	24.557	712.153	10.710
839.980	0.0	0.0	0.0	839.980

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
1014.393	177.566	107.773	27.213	31063.566
37.849	0.0	168.473	0.454	7191.699

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
2.720	181.344	113.340	66.115	0.0
0.366	0.0	0.0	0.0	17.001

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	32.113	221062.687	4.420
136.008	0.944	0.0	3.390	69.391

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	16.238
3.600	484.621	1.113	0.018	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.361	0.0	0.0	0.0
0.0	1376.650	3328.990	1626.950

Table A.16 Rapid Rail Aerial Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
945.000	2620.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	16122.000	1614.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
26381.211	4233.379	18048.375	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
934.179	279.852	6521.383	0.0
10154.004	8149.109	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
135803.375	43761.352	18802.762	1930.038	25019.250
1664.882	32954.457	2172.203	12878.793	99201.562

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
6.609	15.478	2.367	68.652	3.859
219.625	0.0	0.0	0.0	219.625

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
97.788	17.117	14.787	2.738	27937.984
9.335	0.0	19.273	0.112	6465.926

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.262	17.482	10.926	6.373	0.0
0.090	0.0	0.0	0.0	1.639

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.096	54519.477	0.0
13.111	0.091	0.0	0.0	17.113

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	4.005
0.0	119.519	0.275	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.089	0.0	0.0	0.0
0.0	1366.750	3305.050	1615.250

Table A.17 Rapid Rail Aerial Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
945.000	2620.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	16122.000	1614.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
27485.805	4427.531	18832.684	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
984.855	295.034	6816.562	0.0
10345.652	8328.781	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
143067.187	45536.738	19792.937	2005.620	25985.047
1699.694	33595.070	2213.824	13154.156	101336.562

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
6.941	16.065	2.457	71.253	4.057
223.770	0.0	0.0	0.0	223.770

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
101.493	17.766	15.220	2.839	29445.617
9.524	0.0	19.916	0.114	6815.691

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.272	18.144	11.340	6.615	0.0
0.092	0.0	0.0	0.0	1.701

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.213	55625.543	0.0
13.608	0.094	0.0	0.0	17.461

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	4.086
0.0	121.944	0.280	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.091	0.0	0.0	0.0
0.0	1441.000	3484.600	1703.000

Table A.18 Rapid Rail Aerial C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
945.000	2620.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	16122.000	1614.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
29694.992	4815.836	20401.301	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1086.208	325.397	7406.922	0.0
10708.277	8679.250	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
157594.875	49087.508	21773.285	2156.784	27916.641
1766.812	34814.754	2292.825	13688.270	105482.687

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
7.605	17.238	2.636	76.456	4.453
231.614	0.0	0.0	0.0	231.614

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
108.904	19.063	16.074	3.039	32460.734
9.888	0.0	21.193	0.119	7515.203

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.292	19.469	12.168	7.098	0.0
0.096	0.0	0.0	0.0	1.825

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.448	57749.625	0.0
14.602	0.101	0.0	0.0	18.127

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	4.242
0.0	126.601	0.291	0.005	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.094	0.0	0.0	0.0
0.0	1589.500	3843.699	1878.500

Table A.19 Rapid Rail At-Grade Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
701.000	365.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	14127.000	22720.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
15574.605	1828.906	9151.516	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
802.571	235.970	2932.854	0.0
6175.238	3550.420	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
178845.375	28283.477	3479.298	1351.134	18048.145
826.896	19029.535	1287.311	6078.242	46061.371

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
1.831	11.585	1.772	51.385	0.926
133.567	0.0	0.0	0.0	133.567

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
73.193	12.812	9.498	2.009	3847.834
4.960	0.0	13.345	0.060	833.204

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.196	13.085	8.178	4.770	0.0
0.048	0.0	0.0	0.0	1.227

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	2.317	28969.812	0.0
9.814	0.068	0.0	0.0	9.093

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.128
0.0	63.509	0.146	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.047	0.0	0.0	0.0
0.0	166.100	401.660	196.300

Table A.20 Rapid Rail At-Grade Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
701.000	365.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	14127.000	22720.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
16163.020	1927.109	9556.664	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
826.301	243.079	3082.851	0.0
6644.734	3797.435	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
182261.125	29248.770	3948.491	1393.056	18588.234
889.210	20459.828	1384.634	6511.762	49330.680

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
1.992	11.917	1.823	52.855	1.021
143.722	0.0	0.0	0.0	143.722

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
75.287	13.179	9.943	2.071	4557.750
5.326	0.0	13.846	0.064	997.014

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.202	13.459	8.412	4.907	0.0
0.051	0.0	0.0	0.0	1.262

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	2.383	31104.090	0.0
10.094	0.070	0.0	0.0	9.763

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.285
0.0	68.187	0.157	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.051	0.0	0.0	0.0
0.0	200.750	485.450	237.250

Table A.21 Rapid Rail At-Grade C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
701.000	365.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	14127.000	22720.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
17339.848	2123.516	10366.961	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
873.760	257.296	3382.845	0.0
7277.328	4159.883	2129.745	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
189092.625	31179.359	4886.879	1476.900	19668.418
976.698	22408.320	1516.477	7132.852	54036.492

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
2.314	12.580	1.924	55.796	1.211
157.404	0.0	0.0	0.0	157.404

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
79.476	13.912	10.660	2.190	5975.340
5.833	0.0	14.729	0.070	1324.368

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.213	14.208	8.880	5.180	0.0
0.056	0.0	0.0	0.0	1.332

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	2.516	34068.035	0.0
10.656	0.074	0.0	0.0	10.694

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.502
0.0	74.685	0.172	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.056	0.0	0.0	0.0
0.0	270.050	653.030	319.150

Table A.22 Rapid Rail Cut and Cover Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
5167.000	12958.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	79731.000	302395.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
135759.750	20902.734	89518.625	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4318.336	1293.650	32204.176	0.0
40911.973	34590.734	8092.781	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
632928.062	229134.812	88325.750	10226.793	133193.375
6900.590	134043.125	8794.289	54083.004	417532.687

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
31.755	82.892	12.678	367.650	18.377
884.902	0.0	0.0	0.0	884.902

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
523.682	91.669	70.294	14.433	129304.312
38.506	0.0	97.090	0.462	29938.625

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.404	93.619	58.512	34.132	0.0
0.372	0.0	0.0	0.0	8.777

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	16.578	224899.812	0.0
70.214	0.488	0.0	0.0	70.595

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	16.520
0.0	493.032	1.133	0.018	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.367	0.0	0.0	0.0
0.0	6318.949	15280.367	7467.844

Table A.23 Rapid Rail Cut and Cover Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
5167.000	12958.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	79731.000	302395.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
145968.562	22826.742	97081.437	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4870.598	1459.091	35112.113	0.0
48823.492	39045.750	8092.781	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
711329.375	245057.750	98923.750	10884.129	141483.500
7985.453	158355.687	10441.301	61753.359	475594.125

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
35.217	87.839	13.434	389.591	20.461
1056.023	0.0	0.0	0.0	1056.023

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
554.935	97.140	77.594	15.375	145752.000
44.813	0.0	105.022	0.538	33743.348

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.488	99.206	62.004	36.169	0.0
0.433	0.0	0.0	0.0	9.301

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	17.568	261736.000	0.0
74.405	0.517	0.0	0.0	82.158

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	19.226
0.0	573.786	1.318	0.021	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.427	0.0	0.0	0.0
0.0	7126.898	17234.137	8422.695

Table A.24 Rapid Rail Cut and Cover C.B.D., R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
5167.000	12958.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	79731.000	302395.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
166386.250	26674.758	112207.000	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
5975.117	1789.972	40927.984	0.0
62394.273	46987.965	8092.781	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
868131.937	276903.687	120119.687	12198.801	158063.750
9882.141	200275.875	13273.668	75285.375	578238.062

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
42.140	97.733	14.947	433.474	24.628
1349.551	0.0	0.0	0.0	1349.551

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
617.442	108.081	90.923	17.227	178630.875
55.785	0.0	120.011	0.669	41350.809

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.656	110.381	68.988	40.243	0.0
0.539	0.0	0.0	0.0	10.348

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	19.547	325816.687	0.0
82.786	0.575	0.0	0.0	102.272

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	23.933
0.0	714.265	1.641	0.026	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.532	0.0	0.0	0.0
0.0	8742.797	21141.676	10332.395

Table A.25 Rapid Rail Rock Tunnel Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4726.000	6528.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	40167.000	132810.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
113618.000	15223.719	69466.562	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
2154.384	645.391	23807.570	0.0
35173.539	24503.312	75698.437	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
331977.437	200240.062	48531.496	9279.871	122601.812
5287.699	111472.187	7435.121	39963.125	305816.312

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
19.686	77.664	11.878	344.465	10.876
760.783	0.0	0.0	0.0	760.783

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
490.656	85.888	61.491	13.408	65282.152
30.435	0.0	87.958	0.365	15109.102

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.316	87.715	54.822	31.979	0.0
0.294	0.0	0.0	0.0	8.223

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	15.533	177759.312	0.0
65.786	0.457	0.0	0.0	55.798

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	13.057
0.0	389.689	0.895	0.014	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.290	0.0	0.0	0.0
0.0	3152.325	7622.891	3725.475

Table A.26 Rapid Rail Rock Tunnel Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4726.000	6528.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	40167.000	132810.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
119147.250	16266.297	73563.875	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
2453.718	735.063	25383.254	0.0
38512.719	25537.992	79844.000	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
374484.750	208862.250	54277.184	9635.730	127089.375
5698.457	121124.875	8109.977	42145.172	321737.250

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
21.563	80.342	12.288	356.340	12.006
833.007	0.0	0.0	0.0	833.007

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
507.572	88.849	64.526	13.894	74184.812
32.666	0.0	91.620	0.392	17170.594

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.361	90.739	56.712	33.082	0.0
0.316	0.0	0.0	0.0	8.507

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	16.068	190787.750	0.0
68.054	0.473	0.0	0.0	59.887

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	14.014
0.0	418.251	0.961	0.015	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.311	0.0	0.0	0.0
0.0	3590.400	8682.234	4243.199

Table A.27 Rapid Rail Rock Tunnel C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4726.000	6528.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	40167.000	132810.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
130205.750	18351.453	81758.562	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3052.384	914.407	28534.621	0.0
44407.184	27607.352	88135.062	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
459499.312	226106.625	65768.500	10347.449	136064.500
6446.496	138339.000	9307.086	46300.156	352307.312

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
25.316	85.697	13.107	380.091	14.265
960.501	0.0	0.0	0.0	960.501

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
541.403	94.771	70.286	14.859	91986.250
36.727	0.0	98.732	0.441	21293.098

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.452	96.787	60.492	35.287	0.0
0.355	0.0	0.0	0.0	9.074

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	17.139	214509.562	0.0
72.590	0.504	0.0	0.0	67.334

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	15.757
0.0	470.254	1.080	0.017	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.350	0.0	0.0	0.0
0.0	4466.547	10800.926	5278.648

Table A.28 Rapid Rail Earth Tunnel Suburban R.O.W.- Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
11304.000	3158.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19432.000	126710.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
234864.312	26059.555	130173.687	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1001.593	300.048	41673.625	0.0
45185.199	41830.473	127971.875	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
218783.375	434346.500	40307.391	20906.180	280005.125
7103.879	150655.125	9799.891	64258.160	497962.562

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
24.421	180.311	27.577	799.730	11.842
977.329	0.0	0.0	0.0	977.329

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
1139.138	199.402	122.405	30.597	33275.934
44.378	0.0	190.190	0.533	7696.496

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
3.055	203.645	127.278	74.245	0.0
0.429	0.0	0.0	0.0	19.092

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	36.062	259193.437	0.0
152.733	1.061	0.0	0.0	81.360

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	19.039
0.0	568.212	1.305	0.021	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.423	0.0	0.0	0.0
0.0	1465.475	3543.784	1731.925

Table A.29 Rapid Rail Earth Tunnel Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
11304.000	3158.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19432.000	126710.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
251159.500	28046.332	139617.937	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1187.057	355.608	44810.789	0.0
49318.621	44549.094	137350.437	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
249678.437	463823.250	45122.359	22300.102	298557.312
7684.844	163639.000	10669.770	68753.625	532267.250

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
26.663	192.168	29.390	852.321	13.022
1066.733	0.0	0.0	0.0	1066.733

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
1214.049	212.515	130.901	32.621	38998.633
47.873	0.0	203.005	0.574	9021.297

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
3.256	217.037	135.648	79.128	0.0
0.463	0.0	0.0	0.0	20.347

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	38.434	279603.625	0.0
162.777	1.130	0.0	0.0	87.766

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	20.538
0.0	612.956	1.408	0.023	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.456	0.0	0.0	0.0
0.0	1736.900	4200.137	2052.700

Table A.30 Rapid Rail Earth Tunnel C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
11304.000	3158.000	0.0	0.0	9.000

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19432.000	126710.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
283749.937	32019.887	158506.500	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1557.986	466.728	51085.117	0.0
56862.562	49986.336	156107.562	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
311468.625	522776.812	54752.297	25087.941	335661.687
8779.020	187678.187	12268.801	77551.750	599703.937

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
31.148	215.883	33.017	957.504	15.382
1229.903	0.0	0.0	0.0	1229.903

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
1363.872	238.741	147.607	36.661	50440.324
54.493	0.0	228.437	0.654	11670.453

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
3.657	243.821	152.388	88.893	0.0
0.527	0.0	0.0	0.0	22.858

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	43.177	318270.687	0.0
182.865	1.270	0.0	0.0	99.904

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	23.379
0.0	697.723	1.603	0.026	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.519	0.0	0.0	0.0
0.0	2279.750	5512.848	2694.250

Table A.31 Commuter Rail At-Grade Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
1078.000	871.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
12.250	13272.000	11555.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
25311.785	3213.374	14691.777	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
775.596	229.377	5003.883	4.215
5577.238	3937.629	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
157108.500	45165.074	7949.824	2128.958	28302.254
840.500	17713.090	1180.195	6401.957	49022.238

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
3.597	18.064	2.763	80.119	1.911
120.632	0.0	0.0	0.0	120.632

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
114.122	19.977	15.373	3.145	9901.238
5.483	0.0	21.564	0.128	2258.506

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.306	20.402	12.751	7.438	0.0
0.068	0.0	0.0	0.0	1.913

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	3.613	48921.934	4.420
15.301	0.106	0.0	3.390	13.936

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	3.594
3.600	113.974	0.227	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.080	0.0	0.0	0.0
0.0	463.204	1120.112	547.423

Table A.32 Commuter Rail At-Grade Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2005.000	1869.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
12.250	19409.000	11582.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
48088.930	6178.262	28347.930	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1155.125	343.075	9649.559	4.215
8194.934	6508.832	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
216618.375	85663.625	16776.320	4017.645	53312.684
1329.909	26547.387	1751.476	10309.125	79371.500

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
7.300	33.952	5.193	150.587	3.932
177.252	0.0	0.0	0.0	177.252

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
214.497	37.547	25.180	5.815	21414.031
8.129	0.0	37.648	0.159	4928.723

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.575	38.346	23.966	13.980	0.0
0.093	0.0	0.0	0.0	3.595

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	6.790	64378.102	4.420
28.759	0.200	0.0	3.390	18.788

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	4.729
3.600	147.858	0.305	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.105	0.0	0.0	0.0
0.0	1018.974	2464.064	1204.242

Table A.33 Commuter Rail At-Grade C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
3574.000	3576.000	0.0	5.000	0.400

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
12.250	29910.000	12250.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
86567.687	11196.578	51441.187	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1802.724	537.078	17510.984	4.215
12531.051	10808.184	1419.830	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
317979.250	154045.000	31793.598	7205.301	95517.625
2145.387	41210.070	2698.750	16831.426	130052.625

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.585	60.758	9.292	269.479	7.365
271.039	0.0	0.0	0.0	271.039

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.660	120.500	49.700
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
383.847	67.191	41.678	10.320	41052.418
12.533	0.0	64.753	0.212	9481.203

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.029	68.621	42.888	25.018	0.0
0.136	0.0	0.0	0.0	6.433

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	12.152	90100.562	4.420
51.466	0.357	0.0	3.390	26.862

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.013	0.0	0.0	0.0	6.619
3.600	204.247	0.434	0.006	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.147	0.0	0.0	0.0
0.0	1966.800	4756.074	2324.400

Table A.34 Highway Aerial Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2719.000	2913.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	17917.000	10560.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
66193.062	8602.531	39652.887	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1094.533	327.893	13481.691	0.0
6720.477	6692.754	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
171741.875	117745.562	25496.543	5493.141	72751.000
1267.379	22746.508	1468.865	10145.324	78846.750

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
10.720	46.223	7.069	205.013	5.846
145.360	0.0	0.0	0.0	145.360

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
292.020	51.117	27.866	7.752	33202.043
6.841	0.0	46.337	0.082	7698.531

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.783	52.205	32.628	19.033	0.0
0.066	0.0	0.0	0.0	4.894

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	9.245	39953.984	0.0
39.154	0.272	0.0	0.0	12.541

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.935
0.0	87.588	0.201	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.065	0.0	0.0	0.0
0.0	1602.150	3874.290	1893.450

Table A.35 Highway Aerial Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2719.000	2913.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	17917.000	10560.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
66193.062	8602.531	39652.887	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1094.533	327.893	13481.691	0.0
6891.230	6766.039	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
171741.875	117745.562	25496.543	5493.141	72751.000
1288.074	23254.777	1503.864	10282.336	79867.750

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
10.720	46.223	7.069	205.013	5.846
149.053	0.0	0.0	0.0	149.053

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
292.020	51.117	27.962	7.754	33203.297
6.965	0.0	46.403	0.084	7698.684

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.783	52.205	32.628	19.033	0.0
0.067	0.0	0.0	0.0	4.894

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	9.245	40680.898	0.0
39.154	0.272	0.0	0.0	12.770

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.988
0.0	89.182	0.205	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.066	0.0	0.0	0.0
0.0	1602.150	3874.290	1893.450

Table A.36 Highway Aerial C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2719.000	2913.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	17917.000	10560.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
66193.062	8602.531	39652.887	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1094.533	327.893	13481.691	0.0
7066.000	6841.016	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
171741.875	117745.562	25496.543	5493.141	72751.000
1309.253	23774.984	1539.685	10422.527	80912.437

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
10.720	46.223	7.069	205.013	5.846
152.833	0.0	0.0	0.0	152.833

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
292.020	51.117	28.061	7.757	33204.582
7.093	0.0	46.471	0.085	7698.836

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.783	52.205	32.628	19.033	0.0
0.069	0.0	0.0	0.0	4.894

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	9.245	41424.820	0.0
39.154	0.272	0.0	0.0	13.003

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	3.043
0.0	90.813	0.209	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.068	0.0	0.0	0.0
0.0	1602.150	3874.290	1893.450

Table A.37 Highway At-Grade Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	26400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
4752.516	1113.374	3751.397	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1378.843	406.196	1503.660	0.0
2358.126	1370.324	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
99145.687	7122.785	6128.559	278.760	3401.671
1045.872	7277.230	491.931	2339.224	17736.887

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
2.778	1.959	0.300	8.691	1.156
51.005	0.0	0.0	0.0	51.005

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
12.379	2.167	2.975	0.376	35043.293
2.028	0.0	3.118	0.031	2181.782

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.033	2.213	1.383	0.807	0.0
0.023	0.0	0.0	0.0	0.207

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.392	15221.926	0.0
1.660	0.012	0.0	0.0	4.494

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	1.118
0.0	29.345	0.073	0.001	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.025	0.0	0.0	0.0
0.0	464.436	1123.092	548.879

Table A.38 Highway At-Grade Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	26400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
6453.207	1342.491	4789.801	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1412.166	416.179	1861.272	0.0
2964.391	1737.621	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
104261.625	10117.707	6873.953	417.322	5231.152
1133.020	9158.973	618.765	2959.340	22449.180

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
3.078	3.117	0.477	13.827	1.322
64.118	0.0	0.0	0.0	64.118

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
19.695	3.448	3.925	0.576	36052.492
2.524	0.0	4.452	0.037	2415.344

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.053	3.521	2.201	1.284	0.0
0.027	0.0	0.0	0.0	0.330

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.623	18121.879	0.0
2.641	0.018	0.0	0.0	5.404

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	1.331
0.0	35.702	0.087	0.001	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.030	0.0	0.0	0.0
0.0	513.199	1241.009	606.508

Table A.39 Highway At-Grade C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	26400.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
9331.301	1730.226	6547.105	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1468.557	433.072	2466.461	0.0
3704.872	2236.584	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
112919.375	15186.031	8135.391	651.812	8327.203
1245.894	11493.551	774.885	3779.578	28715.863

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
3.586	5.077	0.777	22.519	1.604
80.134	0.0	0.0	0.0	80.134

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
32.076	5.615	5.372	0.912	37758.281
3.156	0.0	6.599	0.045	2810.351

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.086	5.734	3.584	2.091	0.0
0.033	0.0	0.0	0.0	0.538

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	1.015	21813.801	0.0
4.301	0.030	0.0	0.0	6.563

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	1.602
0.0	43.796	0.106	0.001	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.036	0.0	0.0	0.0
0.0	595.721	1440.562	704.034

Table A.40 Highway Open Cut Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	100880.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

	FUEL OIL	NATURAL GAS	LPG
COAL	4752.516	1113.374	3751.397	0.0
	0.0	0.0	0.0	0.0

	GASOLINE	ELECTRICITY	OTHER
DIESEL	1378.843	406.196	1503.660	0.0
	4766.059	2402.616	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
PARTICULATES	99145.687	7122.785	6128.559	278.760	3401.671
	1337.628	14443.953	985.447	4269.871	32122.891

	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
ALDEHYDES	2.778	1.959	0.300	8.691	1.156
	103.087	0.0	0.0	0.0	103.087

	COPPER SULFIDE	LEAD SULFIDE
HEAVY METALS	0.0	0.0	0.0
	0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

	CYANIDE	O AND G	PHENOL	TSS
AMMONIA	12.379	2.167	4.334	0.411	35060.969
	3.782	0.0	4.053	0.052	2183.888

	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
SULFIDE	0.033	2.213	1.383	0.807	0.0
	0.040	0.0	0.0	0.0	0.207

	LEAD	MANGANESE	TDS	BOD 5
NITRATE	0.0	0.0	0.392	25469.332	0.0
	1.660	0.012	0.0	0.0	7.711

	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
HEAVY METALS	0.0	0.0	0.0	1.871
	0.0	51.809	0.124	0.002	0.0

	ALKALINITY	POTASSIUM	SULFATE
ARSENIC	0.042	0.0	0.0	0.0
	0.0	464.436	1123.092	548.879

Table A.41 Highway Open Cut Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	100880.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
6453.207	1342.491	4789.801	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1412.166	416.179	1861.272	0.0
6576.664	3286.805	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
104261.625	10117.707	6873.953	417.322	5231.152
1570.737	19910.586	1359.128	5856.336	44036.352

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
3.078	3.117	0.477	13.827	1.322
142.249	0.0	0.0	0.0	142.249

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
19.695	3.448	5.964	0.630	36079.012
5.156	0.0	5.856	0.069	2418.502

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.053	3.521	2.201	1.284	0.0
0.053	0.0	0.0	0.0	0.330

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.623	33496.309	0.0
2.641	0.018	0.0	0.0	10.230

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.461
0.0	69.406	0.165	0.002	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.055	0.0	0.0	0.0
0.0	513.199	1241.009	606.508

Table A.42 Highway Open Cut C.B.D., R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
317.000	1107.000	42.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	25112.000	100880.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
9331.301	1730.226	6547.105	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1468.557	433.072	2466.461	0.0
8549.789	4314.574	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
112919.375	15186.031	8135.391	651.812	8327.203
1832.987	25914.148	1767.892	7665.348	57671.090

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
3.586	5.077	0.777	22.519	1.604
184.927	0.0	0.0	0.0	184.927

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
32.076	5.615	8.106	0.983	37793.844
6.687	0.0	8.482	0.087	2814.587

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.086	5.734	3.584	2.091	0.0
0.068	0.0	0.0	0.0	0.538

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	1.015	42435.078	0.0
4.301	0.030	0.0	0.0	13.036

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	3.117
0.0	89.002	0.210	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.069	0.0	0.0	0.0
0.0	595.721	1440.562	704.034

Table A.43 Highway Cut and Cover Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
1985.000	5009.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	30823.000	190100.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
56106.508	8779.273	37215.141	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1882.905	564.063	13491.359	0.0
17897.574	14694.676	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
274875.500	94232.312	38213.816	4183.199	54367.051
3003.253	58324.219	3836.698	23113.363	178213.812

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.591	33.745	5.161	149.669	7.899
387.114	0.0	0.0	0.0	387.114

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
213.189	37.318	29.349	5.895	56335.008
16.622	0.0	40.030	0.199	13041.945

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.572	38.112	23.820	13.895	0.0
0.161	0.0	0.0	0.0	3.573

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	6.749	97082.500	0.0
28.584	0.198	0.0	0.0	30.474

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	7.131
0.0	212.827	0.489	0.008	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.158	0.0	0.0	0.0
0.0	2754.950	6661.969	3255.850

Table A.44 Highway Cut and Cover Center City, R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
1985.000	5009.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	30823.000	190100.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
56106.508	8779.273	37215.141	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1882.905	564.063	13491.359	0.0
20971.492	16013.969	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
274875.500	94232.312	38213.816	4183.199	54367.051
3375.799	67474.125	4466.742	25579.844	196593.875

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.591	33.745	5.161	149.669	7.899
453.601	0.0	0.0	0.0	453.601

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
213.189	37.318	31.085	5.940	56357.578
18.863	0.0	41.225	0.226	13044.629

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.572	38.112	23.820	13.895	0.0
0.182	0.0	0.0	0.0	3.573

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	6.749	110168.500	0.0
28.584	0.198	0.0	0.0	34.581

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	8.092
0.0	241.515	0.555	0.009	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.180	0.0	0.0	0.0
0.0	2754.950	6661.969	3255.850

Table A.45 Highway Cut and Cover C.B.D., R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
1985.000	5009.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	30823.000	190100.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
56106.508	8779.273	37215.141	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1882.905	564.063	13491.359	0.0
24117.652	17363.676	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
274875.500	94232.312	38213.816	4183.199	54367.051
3757.060	76838.750	5111.582	28103.555	215399.750

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.591	33.745	5.161	149.669	7.899
521.651	0.0	0.0	0.0	521.651

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
213.189	37.318	32.861	5.986	56380.672
21.155	0.0	42.447	0.254	13047.383

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.572	38.112	23.820	13.895	0.0
0.205	0.0	0.0	0.0	3.573

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	6.749	123560.312	0.0
28.584	0.198	0.0	0.0	38.785

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	9.076
0.0	270.873	0.622	0.010	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.202	0.0	0.0	0.0
0.0	2754.950	6661.969	3255.850

Table A.46 Busway Aerial Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2921.000	3129.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19246.000	2178.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
68651.312	8921.898	41125.238	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1135.125	340.053	13982.219	0.0
6701.375	6835.828	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
178110.687	122118.750	26442.234	5697.176	75453.312
1283.046	22798.566	1468.581	10318.789	80268.250

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
11.118	47.940	7.332	212.628	6.062
144.947	0.0	0.0	0.0	144.947

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
302.867	53.016	28.753	8.036	34431.562
6.904	0.0	47.956	0.083	7983.746

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.812	54.144	33.840	19.740	0.0
0.067	0.0	0.0	0.0	5.076

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	9.588	40323.266	0.0
40.608	0.282	0.0	0.0	12.657

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	2.962
0.0	88.398	0.203	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.066	0.0	0.0	0.0
0.0	1661.550	4017.929	1963.650

Table A.47 Busway Aerial Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2921.000	3129.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19246.000	2178.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
71109.562	9241.270	42597.594	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1175.719	352.214	14482.750	0.0
6991.004	7111.273	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
184479.562	126491.937	27387.926	5901.211	78155.625
1336.120	23769.508	1531.572	10739.809	83534.437

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
11.516	49.657	7.595	220.243	6.279
151.211	0.0	0.0	0.0	151.211

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
313.715	54.915	29.815	8.324	35663.340
7.192	0.0	49.695	0.086	8269.223

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.841	56.083	35.052	20.447	0.0
0.070	0.0	0.0	0.0	5.258

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	9.931	42006.457	0.0
42.062	0.292	0.0	0.0	13.186

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	3.086
0.0	92.088	0.212	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.069	0.0	0.0	0.0
0.0	1720.950	4161.566	2033.850

Table A.48 Busway Aerial C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
2921.000	3129.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	19246.000	2178.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
76026.062	9880.012	45542.305	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
1256.905	376.535	15483.809	0.0
7538.422	7648.496	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
197217.250	135238.312	29279.309	6309.281	83560.250
1438.410	25616.613	1651.029	11556.289	89876.312

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
12.311	53.091	8.120	235.474	6.713
163.052	0.0	0.0	0.0	163.052

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
335.410	58.712	31.920	8.901	38126.672
7.745	0.0	53.162	0.093	8840.152

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.899	59.962	37.476	21.861	0.0
0.075	0.0	0.0	0.0	5.621

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	10.618	45237.270	0.0
44.971	0.312	0.0	0.0	14.200

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	3.323
0.0	99.171	0.228	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.074	0.0	0.0	0.0
0.0	1839.750	4448.848	2174.250

Table A.49 Busway At-Grade Suburban R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
68.000	181.000	577.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	57442.000	43166.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
1947.435	2007.595	1340.515	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3335.074	977.962	741.233	0.0
8416.090	3913.179	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
214153.187	4111.953	3369.475	180.219	1917.898
11529.109	25268.480	1732.232	7128.742	53379.203

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
12.601	1.156	0.177	5.127	0.282
182.035	0.0	0.0	0.0	182.035

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
7.303	1.278	12.935	0.514	76340.062
8.019	0.0	8.460	0.191	487.047

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.020	1.306	0.816	0.476	0.0
0.118	0.0	0.0	0.0	0.122

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.231	93271.125	0.0
0.979	0.007	0.0	0.0	25.376

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	6.852
0.0	149.173	0.416	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.152	0.0	0.0	0.0
0.0	99.550	240.730	117.650

Table A.50 Busway At-Grade Center City R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
68.000	181.000	577.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	57442.000	43166.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
2017.339	2073.727	1393.423	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3356.202	984.179	769.431	0.0
9353.207	4328.789	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
214737.187	4247.844	3503.939	185.865	1976.435
11964.285	28067.602	1924.630	7897.410	59118.691

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.003	1.190	0.182	5.278	0.297
202.304	0.0	0.0	0.0	202.304

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
7.518	1.316	13.720	0.540	76999.687
8.763	0.0	8.986	0.203	514.012

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.020	1.344	0.840	0.490	0.0
0.127	0.0	0.0	0.0	0.126

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.238	99064.500	0.0
1.008	0.007	0.0	0.0	27.073

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	7.278
0.0	160.148	0.443	0.003	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.162	0.0	0.0	0.0
0.0	105.050	254.030	124.150

Table A.51 Busway At-Grade C.B.D. R.O.W., Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
68.000	181.000	577.000	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	57442.000	43166.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
2157.147	2205.991	1499.239	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3398.458	996.613	825.827	0.0
10588.855	4885.797	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
215905.187	4519.621	3772.867	197.157	2093.509
12757.230	31764.898	2178.534	8922.187	66777.875

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
13.806	1.258	0.192	5.580	0.325
229.031	0.0	0.0	0.0	229.031

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
7.948	1.391	14.930	0.582	78314.312
9.785	0.0	9.788	0.221	567.386

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
0.021	1.421	0.888	0.518	0.0
0.139	0.0	0.0	0.0	0.133

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	0.252	107932.250	0.0
1.066	0.007	0.0	0.0	29.613

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	7.929
0.0	176.138	0.485	0.004	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.176	0.0	0.0	0.0
0.0	116.050	280.630	137.150

Table A.52 Busway Cut and Cover Suburban R.O.W. (Stations with Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4408.000	11181.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69957.000	247220.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
118483.625	18553.039	78621.750	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4018.012	1203.463	28509.004	0.0
33217.258	29524.461	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
581683.875	198946.812	80846.687	8829.711	114745.250
5841.586	109868.812	7174.809	45707.629	353617.500

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
28.741	71.213	10.891	315.850	16.708
718.469	0.0	0.0	0.0	718.469

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
449.898	78.753	59.552	12.377	120215.312
31.998	0.0	82.833	0.384	27595.844

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.206	80.429	50.268	29.323	0.0
0.309	0.0	0.0	0.0	7.540

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	14.243	186888.687	0.0
60.322	0.419	0.0	0.0	58.663

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	13.728
0.0	409.703	0.941	0.015	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.305	0.0	0.0	0.0
0.0	5830.273	14098.660	6890.320

Table A.53 Busway Cut and Cover Center City R.O.W. (Stations with Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4408.000	11181.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69957.000	247220.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
124748.937	19545.797	82807.562	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4269.941	1278.717	30032.754	0.0
38931.117	32789.770	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
613513.812	209423.187	85252.250	9292.906	120755.562
6630.770	127462.250	8365.461	51307.008	396036.000

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
30.296	74.936	11.461	332.363	17.614
842.057	0.0	0.0	0.0	842.057

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
473.419	82.870	64.916	13.083	127812.000
36.578	0.0	88.714	0.439	29109.652

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.270	84.634	52.896	30.856	0.0
0.354	0.0	0.0	0.0	7.934

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	14.987	213634.875	0.0
63.475	0.441	0.0	0.0	67.059

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	15.693
0.0	468.337	1.076	0.017	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.349	0.0	0.0	0.0
0.0	6149.547	14870.727	7267.645

Table A.54 Busway Cut and Cover C.B.D., R.O.W. (Stations with Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4408.000	11181.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69957.000	247220.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
137279.625	21531.312	91179.125	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4773.809	1429.224	33080.254	0.0
47172.457	37952.008	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
677173.687	230376.000	94063.312	10219.293	132776.187
7822.898	153163.875	10093.656	59947.926	461812.187

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
33.407	82.382	12.600	365.388	19.428
1020.312	0.0	0.0	0.0	1020.312

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
520.460	91.105	73.846	14.448	142982.250
43.413	0.0	99.236	0.521	32134.473

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.396	93.043	58.152	33.922	0.0
0.420	0.0	0.0	0.0	8.723

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	16.476	253560.125	0.0
69.782	0.485	0.0	0.0	79.591

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	18.625
0.0	555.862	1.277	0.020	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.414	0.0	0.0	0.0
0.0	6788.098	16414.855	8022.293

Table A.55 Busway Cut and Cover Suburban R.O.W. (Stations without Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4388.000	11077.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69317.000	239913.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
118128.687	18485.605	78357.500	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
3998.464	1197.607	28407.152	0.0
32977.141	29348.625	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
578910.937	198395.250	80472.187	8807.031	114459.687
5803.824	109101.625	7123.848	45424.129	351442.875

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
28.619	71.043	10.865	315.096	16.634
713.276	0.0	0.0	0.0	713.276

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
448.824	78.565	59.304	12.345	119633.312
31.786	0.0	82.563	0.381	27461.199

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.204	80.237	50.148	29.253	0.0
0.307	0.0	0.0	0.0	7.522

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	14.209	185649.687	0.0
60.178	0.418	0.0	0.0	58.275

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	13.637
0.0	406.987	0.935	0.015	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.303	0.0	0.0	0.0
0.0	5801.672	14029.500	6856.520

Table A.56 Busway Cut and Cover Center City R.O.W. (Stations without Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4388.000	11077.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69317.000	239913.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
124039.125	19410.930	82279.062	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4230.848	1267.005	29829.051	0.0
38332.727	32387.387	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
607967.875	208320.125	84503.187	9247.547	120184.437
6540.930	125576.250	8239.320	50645.203	390980.312

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
30.052	74.596	11.409	330.855	17.467
829.114	0.0	0.0	0.0	829.114

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
471.271	82.494	64.355	13.017	126647.187
36.067	0.0	88.127	0.433	28840.258

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.264	84.250	52.656	30.716	0.0
0.349	0.0	0.0	0.0	7.898

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	14.919	210653.812	0.0
63.187	0.439	0.0	0.0	66.123

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	15.474
0.0	461.802	1.061	0.017	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.344	0.0	0.0	0.0
0.0	6092.348	14732.406	7200.043

Table A.57 Busway Cut and Cover C.B.D., R.O.W. (Stations without Mezzanines), Materials, Energy and Residuals

BILL OF MATERIALS (TONS)

STEEL	CEMENT	ASPHALT	COPPER	PORCELAIN
4388.000	11077.000	0.0	0.0	0.0

WOOD (MCF)	AGGREGATES	EXCAVATION (CY)
0.0	69317.000	239913.000

FUELS (MILLIONS OF BTUS) OFF-SITE/ON-SITE

COAL	FUEL OIL	NATURAL GAS	LPG
135859.937	21261.578	90122.125	0.0
0.0	0.0	0.0	0.0

DIESEL	GASOLINE	ELECTRICITY	OTHER
4695.613	1405.800	32672.848	0.0
45733.820	37043.477	0.0	0.0

AIR RESIDUALS (LBS) OFF-SITE/ON-SITE

PARTICULATES	NOX	SOX	HYDROCARBONS	CARBON MONOXIDE
666081.812	228169.875	92565.250	10128.574	131634.000
7613.910	148672.000	9791.801	58430.309	450255.000

ALDEHYDES	GAS FLOURIDES	PARTIC. FLOUR.	AMMONIA	ORGANIC ACIDS
32.919	81.702	12.496	362.372	19.134
989.196	0.0	0.0	0.0	989.196

HEAVY METALS	COPPER SULFIDE	LEAD SULFIDE
0.0	0.0	0.0
0.0	0.0	0.0

WATER RESIDUALS (LBS) MINING/MANUFACTURING

AMMONIA	CYANIDE	O AND G	PHENOL	TSS
516.164	90.353	72.587	14.312	140650.812
42.216	0.0	97.970	0.507	31595.477

SULFIDE	FLOURIDE	TOTAL IRON	DISSOLVED IRON	ZINC
1.384	92.275	57.672	33.642	0.0
0.408	0.0	0.0	0.0	8.651

NITRATE	LEAD	MANGANESE	TDS	BOD 5
0.0	0.0	16.340	246568.625	0.0
69.206	0.481	0.0	0.0	77.397

HEAVY METALS	COD	TOTAL CHROMIUM	HEXAVLNT CHRM.	BARIUM
0.0	0.0	0.0	0.0	18.112
0.0	540.535	1.242	0.020	0.0

ARSENIC	ALKALINITY	POTASSIUM	SULFATE
0.402	0.0	0.0	0.0
0.0	6673.699	16138.215	7887.094

APPENDIX B

FUELS AND RESIDUALS CHARACTERISTICS PER VEHICLE CONSTRUCTED

To perform the task of calculating the 76 fuel and residual quantities due to the construction of each TAPCUT vehicle characterized in Ref. 26, a computer program was written. The program, VEHFR (Vehicle Fuels and Residuals), is user interactive and requires a maximum of ten prompted inputs describing the projection year, technology set, and pertinent characteristics of the vehicle for which the computations are to be made. Part of the user responses are coded values and the remainder (component weights) are actual values in pounds. All are recorded on the program output.

The program first asks for the time frame of interest (YEAR?) and the coded response is the following:

1. = 1980
2. = 1990
3. = 2000

It then asks for the technology set (SCENARIO?) The response codes are the following:

0. = All (used only in conjunction with 1980)
1. = A
2. = B
3. = C, C1, or C2*

The next request is for engine type (ENGINE?):

0. = No engine
1. = Otto engine
2. = Otto-stratified-charge engine
3. = Turbocharged Otto engine
4. = Diesel engine
5. = Brayton engine
6. = Stirling engine

Is there an electric motor (MOTOR?) in the vehicle:

0. = No motor
1. = Motor

Battery type (BATTERY?):

0. = No battery
1. = Lead-Acid battery
2. = Ni-Zn battery
3. = Ni-Fe battery

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*Internal program modifications were made to accommodate the effects of policy changes on vehicle bills of materials.

4. = Zn-Cl battery
5. = Li_2-S battery
6. = Na-S (glass) battery

Type of body (BODY?):

1. = Mini auto
2. = Small auto
3. = Medium auto
4. = Large auto
5. = Van
6. = Small bus
7. = Medium bus
8. = Large bus
9. = Moving way (nonaccelerated)
10. = Moving way (accelerated)
11. = Automated guideway transit vehicle
12. = Light rail
13. = Heavy rail
14. = Commuter rail

The preceding six questions and their answers specify the vehicle of interest and the computational path to be followed by the program. The program will then request weight inputs for the major components of the vehicle specified. In the limiting case of the Electric and Hybrid Vehicle (EHV), weight data will be requested for the four major components: engine weight (EW), motor/controller weight (MW), battery weight (BW), and body weight (HW). All these data inputs are displayed on the output so that a complete record of the specified vehicle is documented along with the results of the computation.

When the input needs of the program are satisfied, the computation begins immediately and the output is printed out under eight major headings:

1. Total Btu by Fuel Type
2. Total Air Residuals - Extraction
3. Total Solids - Extraction
4. Total Water Residuals - Extraction
5. Total Air Residuals - Manufacturing
6. Total Solids - Manufacturing
7. Total Water Residuals - Manufacturing
8. Total Battery Btu by Fuel Type

Output mnemonic definitions are, as follows:

Total Btu by Fuel Type:

COAL = Coal
PET = Petroleum
GAS = Natural gas
ELEC = Purchased electricity
HELEC = Purchased hydroelectricity
OTH = Other
TOT = Total Btu

Total Air Residuals - Extraction (lbs):

PART = Particulates
NOX = Nitrogen oxides
SOX = Sulfur oxides
HC = Hydrocarbons
CO = Carbon monoxide
ALD = Aldehydes
OACD = Organic acids

Total Water Residuals - Extraction (lbs):

CYAN = Cyanide
O&G = Oil and gas
TSS = Total suspended solids
SFIDE = Sulfides
FLIDE = Flourides
TFE = Total iron
DFE = Dissolved iron
ZN = Zinc
PB = Lead
MN = Manganese
COD = Chemical oxygen demand
CU = Copper
TDS = Total dissolved solids
BOD = Biological oxygen demand (BOD_5)
HMET = Heavy metals

Total Solids - Extraction (lbs):

SOLIDS = Solids

Total Air Residuals - Manufacturing (lb):

PART = Particulates
NOX = Nitrogen oxides
SOX = Sulfur oxides
HC = Hydrocarbons
CO = Carbon monoxide
GFL = Gaseous Fluorides
PFL = Particulate Fluorides
AMM = Ammonia
HMET = Heavy metals
ALD = Aldehydes
ORG = Organics
SFIDE = Sulfides

Total Solids - Manufacturing (lbs):

SOLIDS = Solids

Total Water Residuals - Manfuacturing (lbs):

AMM = Ammonia
CYAN = Cyanide
O&G = Oil and gas
PHEN = Phenols
TSS = Total suspended solids
SFIDE = Sulfides
FLIDE = Fluorides
TI = Titanium
ZN = Zince
NITR = Nitrates
PB = Lead
MN = Manganese
COD = Chemical oxygen demand
AL = Aluminum
CU = Copper
TDS = Total dissolved solids
BOD = Biological oxygen demand (BOD_5)
HMET = Heavy metals
MO = Molybdenum
ARS = Arsenic
NI = Nickel
OTH = Other (NaCl in the case of the manufacture of KOH)

Total Battery Btu by Fuel Type:

The same definitions given under "Total Btu by Fuel Type" apply.

To simplify the program, only those residuals pertinent to at least one vehicle in the vehicle set were computed. In other words, if a particular residual did not appear in any of the vehicles examined, it was not listed. However, not all residuals appear in all vehicles. In the case where a listed residual does not appear in the manufacturing of a particular vehicle or where a listed residual goes to zero when "best available technology" is applied (a function of time and technology set), the output for that residual is given as 0.0.

In summary, each computational output lists the total Btu and residuals associated with the production of a specific vehicle with a given set of component weights, using a bill of materials specified in the variable data sections of the program.

The program is divided into the following 20 discrete sections:

- Input
- Engine materials and distributions by type, year, and technology set
- Motor/controller materials and distributions by year and technology set
- Battery materials and distributions by type, year, and technology set

- Body materials and distributions by type, year, and technology set
- Energy content of materials by type, year, and technology set
- Air residuals (extraction) by material, year, and technology set
- Solids (extraction) by materials, year, and technology set
- Percent primary/secondary materials manufacture by material, nology set
- Water residuals (manufacturing) by material, year, and technology set
- Computation of Btu and residuals per pound of vehicle component by component
- Computation of total Btu and residual quantities per heat-engine vehicle
- Computation of total Btu and residual quantities per EHV
- Computation of total Btu and residual quantities per electric vehicle without batteries
- Computation of total Btu and residual quantities per heat engine/electric vehicle without batteries
- Output.

The remainder of this appendix presents (1) Fig. B.1, which is the flow diagram discussed earlier in Section 3 and (2) the results of each program run performed to characterize the energy consumed and the air and water residuals produced in manufacturing all vehicles included in the TAPCUT project (Tables B.1-B.317).

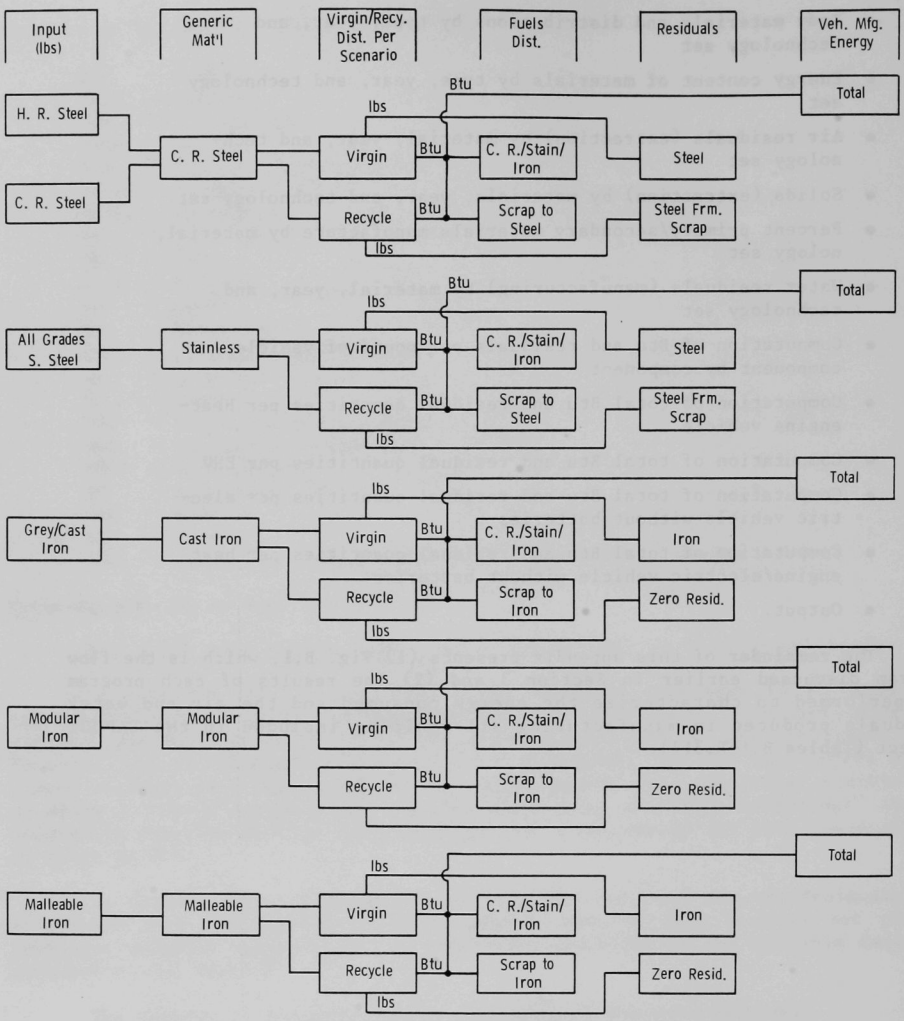

Fig. B.1 Vehicle Production Energy/Residual Computation Flow Diagram

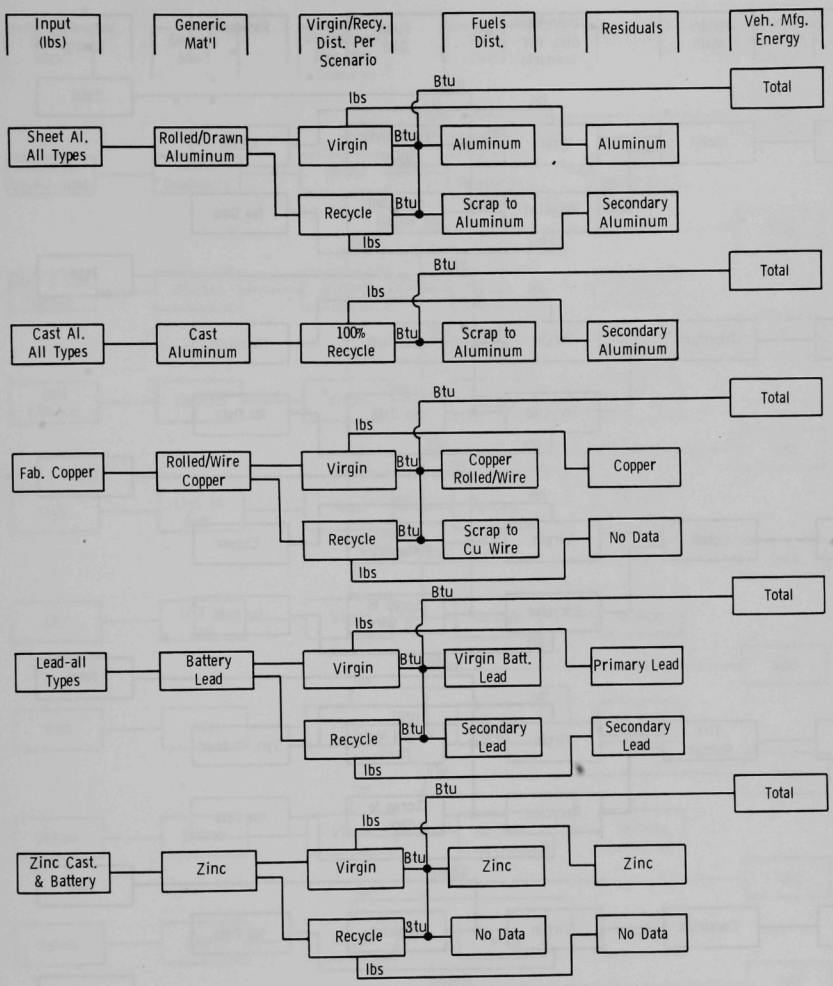
Input (lbs)
Generic Mat'l
Virgin/Recy. Dist. Per Scenario
Fuels Dist.
Residuals
Veh. Mfg. Energy
Sheet Al. All Types
Rolled/Drawn Aluminum
Virgin
Recycle
Aluminum
Scrap to Aluminum
Aluminum
Secondary Aluminum
Total
Cast Al. All Types
Cast Aluminum
100% Recycle
Scrap to Aluminum
Secondary Aluminum
Total
Fab. Copper
Rolled/Wire Copper
Virgin
Recycle
Copper Rolled/Wire
Scrap to Cu Wire
Copper
No Data
Total
Lead-all Types
Battery Lead
Virgin
Recycle
Virgin Batt. Lead
Secondary Lead
Primary Lead
Secondary Lead
Total
Zinc Cast. & Battery
Zinc
Virgin
Recycle
Zinc
No Data
Zinc
No Data
Total
Btu
lbs

Fig. B.1 (Cont'd)

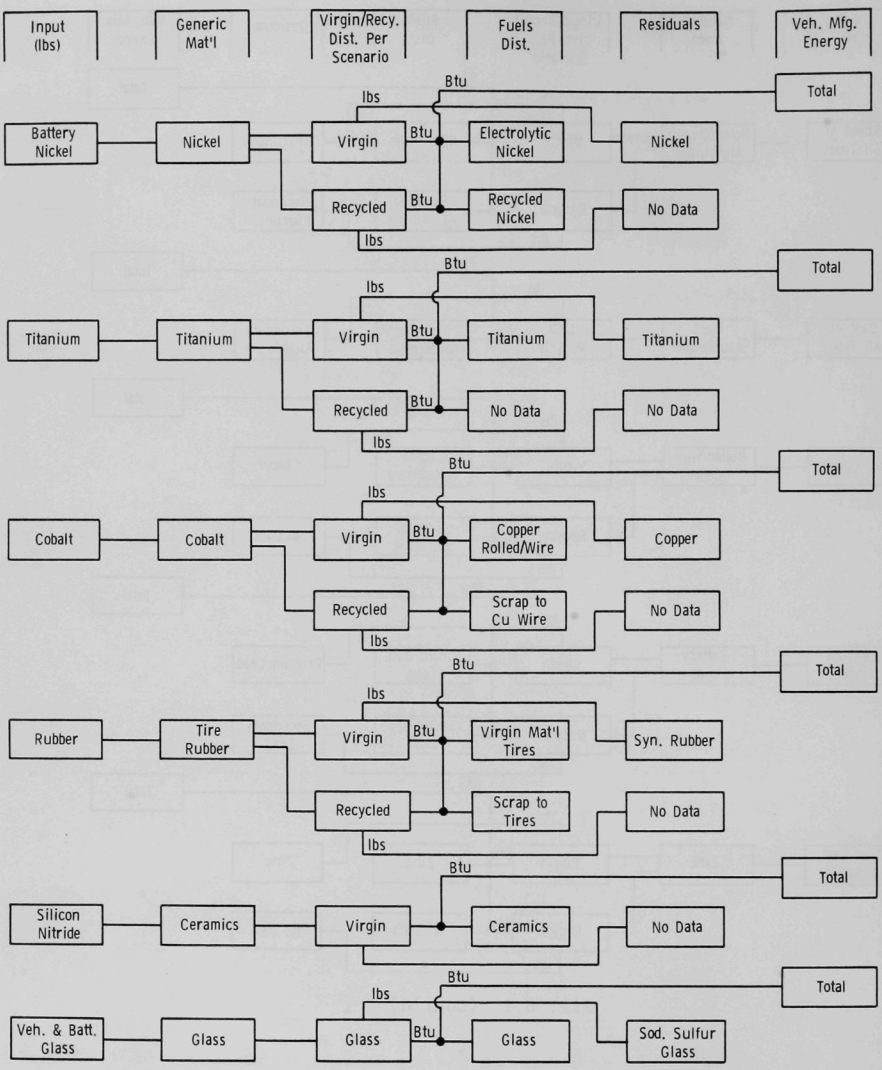
Input (lbs)
Generic Mat'l
Virgin/Recy. Dist. Per Scenario
Fuels Dist.
Residuals
Veh. Mfg. Energy
Battery Nickel
Nickel
Virgin
Recycled
Electrolytic Nickel
Recycled Nickel
Nickel
No Data
Total
Titanium
Titanium
Virgin
Recycled
Titanium
No Data
Titanium
No Data
Total
Cobalt
Cobalt
Virgin
Recycled
Copper Rolled/Wire
Scrap to Cu Wire
Copper
No Data
Total
Rubber
Tire Rubber
Virgin
Recycled
Virgin Mat'l Tires
Scrap to Tires
Syn. Rubber
No Data
Total
Silicon Nitride
Ceramics
Virgin
Ceramics
No Data
Total
Veh. & Batt. Glass
Glass
Glass
Glass
Sod. Sulfur Glass
Total
Btu
lbs

Fig. B.1 (Cont'd)

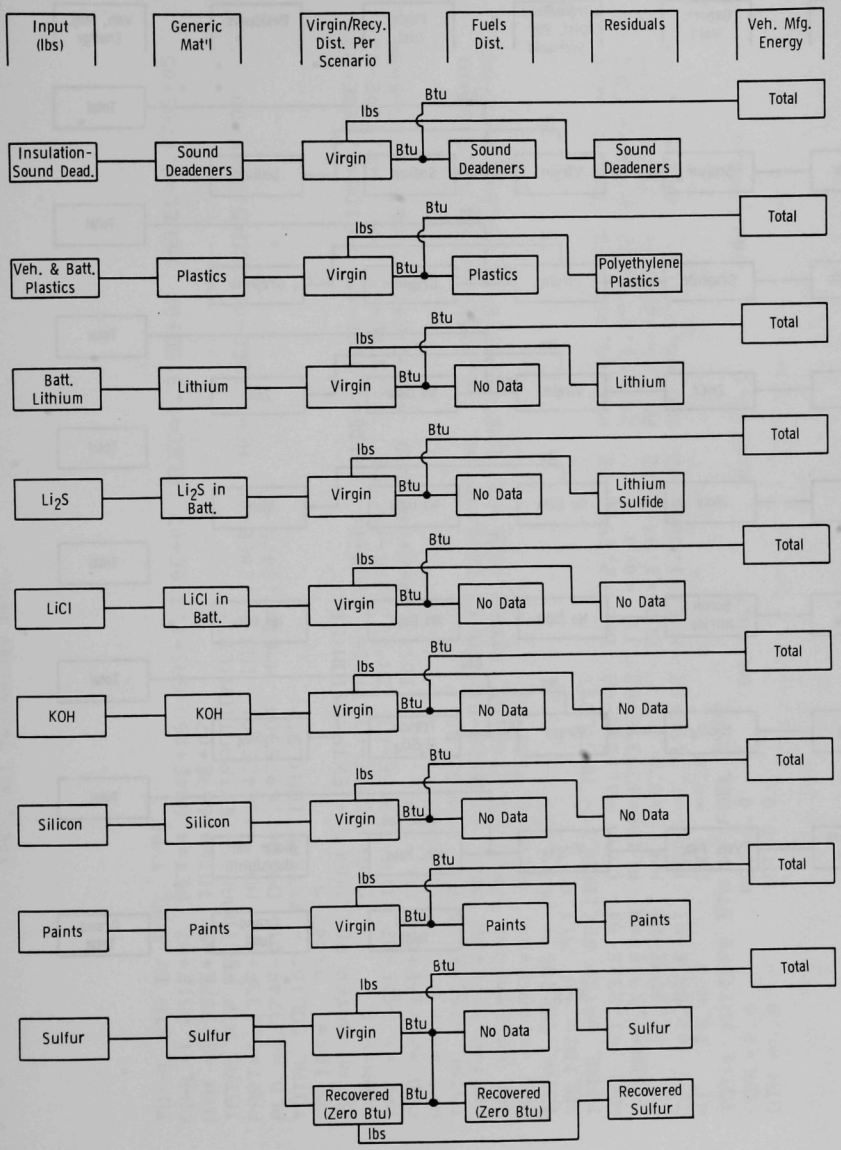
Input (lbs)
Generic Mat'l
Virgin/Recy. Dist. Per Scenario
Fuels Dist.
Residuals
Veh. Mfg. Energy
Insulation-Sound Dead.
Sound Deadeners
Virgin
Sound Deadeners
Sound Deadeners
Total
Veh. & Batt. Plastics
Plastics
Virgin
Plastics
Polyethylene Plastics
Total
Batt. Lithium
Lithium
Virgin
No Data
Lithium
Total
Li_2S
Li_2S in Batt.
Virgin
No Data
Lithium Sulfide
Total
LiCl
LiCl in Batt.
Virgin
No Data
No Data
Total
KOH
KOH
Virgin
No Data
No Data
Total
Silicon
Silicon
Virgin
No Data
No Data
Total
Paints
Paints
Virgin
Paints
Paints
Total
Sulfur
Sulfur
Virgin
No Data
Sulfur
Recovered (Zero Btu)
Recovered (Zero Btu)
Recovered Sulfur
Total
lbs
Btu

Fig. B.1 (Cont'd)

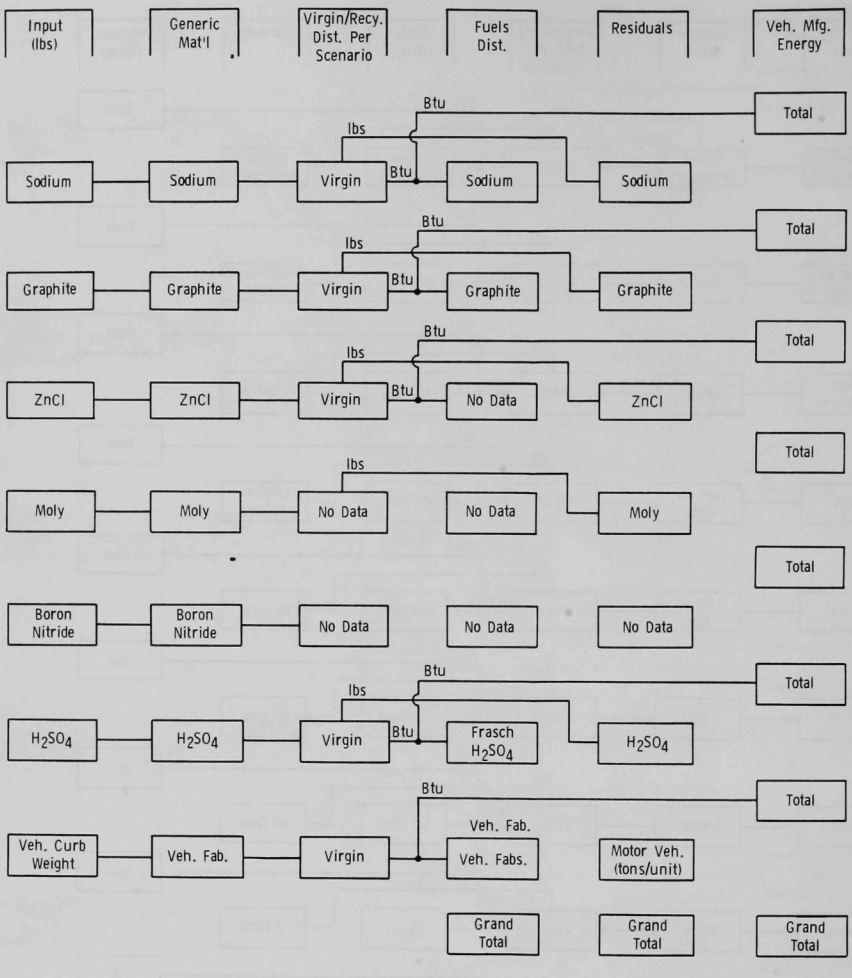
Input (lbs)
Generic Mat'l
Virgin/Recy. Dist. Per Scenario
Fuels Dist.
Residuals
Veh. Mfg. Energy
Sodium
Sodium
Virgin
Btu
lbs
Sodium
Sodium
Total
Graphite
Graphite
Virgin
Graphite
Graphite
Total
ZnCl
ZnCl
Virgin
No Data
ZnCl
Total
Moly
Moly
No Data
No Data
Moly
Total
Boron Nitride
Boron Nitride
No Data
No Data
No Data
Total
H_2SO_4
H_2SO_4
Virgin
Frasch H_2SO_4
H_2SO_4
Total
Veh. Curb Weight
Veh. Fab.
Virgin
Veh. Fab.
Veh. Fabs.
Motor Veh. (tons/unit)
Total
Grand Total
Grand Total
Grand Total

Fig. B.1 (Cont'd)

Table B.1 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 1980, All Technology Sets.

```
TOTAL BTU BY FUEL TYPE
COAL=1.451E+07  PET=4.804E+06  GAS=1.318E+07  ELEC=1.315E+07  HELEC=6.870E+05
OTH =2.937E+05  TOT=4.663E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.133E+00  NOX =4.642E+01  SOX =1.208E+00  HC=3.736E-01  CO=5.058E+00
ALD =4.374E-01  DACD=1.697E-04  HMET=3.847E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33447.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.533E-03  TSS=1.532E+00  SFIDE=1.398E-05  FLIDE=1.023E-03
TFE =1.369E-02  DFE=7.915E-03  ZN =1.189E-05  PB   =1.570E-05  MN   =3.934E-03
COD =2.286E+00  CU =0.0        TDS=7.046E+00  BOD  =1.367E+00  HMET =2.056E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.587E+00  NOX  =2.502E-01  SOX=3.226E+00  HC  =6.076E+00  CO =2.513E+01
GFL =5.255E-02  PFL  =4.210E-02  AMM=2.665E-02  HMET=3.381E-02  ALD=1.065E-08
ORG =6.066E+00  SFIDE=6.711E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      511.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.232E-01  CYAN =2.153E-02  O&G =2.255E-02  PHEN=3.332E-03  TSS =2.462E-01
SFIDE=2.531E-04  FLIDE=4.531E-02  TI  =0.0        ZN  =1.239E-03  NITR=9.772E-03
PB   =7.373E-05  MN   =0.0        COD =1.941E-02  AL  =6.125E-03  CU  =1.750E-05
TDS  =3.583E-01  BOD  =1.319E-02  HMET=1.526E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.2 Mini-Auto, Otto Uniform Charged Engine, Energy and Residuals, 1980, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.477E+06  PET=4.034E+06  GAS=1.276E+07  ELEC=1.187E+07  HELEC=1.188E+06
OTH =2.231E+05  TOT=3.856E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.438E+00  NOX =3.173E+01  SOX =9.212E-01  HC=2.424E-01  CO=3.624E+00
ALD =3.450E-01  OACD=8.302E-05  HMET=2.505E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22814.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.297E-03  TSS=1.178E+00  SFIDE=1.335E-05  FLIDE=8.075E-04
TFE =9.349E-03  DFE=5.406E-03  ZN =8.245E-06  PB   =1.134E-05  MN   =2.692E-03
COD =1.804E+00  CU =0.0        TDS=6.697E+00  BOD  =1.078E+00  HMET =2.300E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.217E+00  NOX  =2.230E-01  SOX=2.338E+00  HC  =6.646E+00  CO =1.731E+01
GFL =1.015E-01  PFL  =8.645E-02  AMM=1.456E-02  HMET=2.401E-02  ALD=1.065E-08
ORG =4.927E+00  SFIDE=4.523E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      420.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.410E-02  CYAN =1.472E-02  O&G =1.748E-02  PHEN=2.303E-03  TSS =3.422E-01
SFIDE=1.883E-04  FLIDE=7.463E-02  TI  =0.0        ZN  =9.144E-04  NITR=7.220E-03
PB   =5.388E-05  MN   =0.0        COD =3.121E-02  AL  =1.808E-02  CU  =5.166E-05
TDS  =4.264E-01  BOD  =1.663E-02  HMET=9.598E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.3 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.413E+06  PET=3.609E+06  GAS=1.566E+07  ELEC=1.758E+07  HELEC=1.076E+06
OTH =9.369E+05  TOT=4.638E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.578E+00  NOX =2.402E+01  SOX =7.756E-01  HC=1.784E-01  CO=2.878E+00
ALD =2.989E-01  DACD=4.593E-05  HMET=2.385E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   17407.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.042E-04  TSS=9.682E-01  SFIDE=1.412E-05  FLIDE=3.750E-04
TFE =6.130E-03  DFE=2.288E-03  ZN =7.346E-06  PB   =1.051E-05  MN   =2.037E-03
COD =1.564E+00  CU =0.0        TDS=3.281E+00  BOD  =9.329E-01  HMET =3.209E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.831E+00  NOX  =1.730E-01  SOX=1.911E+00  HC  =6.527E+00  CO =1.313E+01
AFL =1.208E-01  PFL  =1.049E-01  AMM=9.204E-03  HMET=2.423E-02  ALD=1.065E-08
ORG =5.210E+00  SFIDE=4.201E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     365.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.256E-03  CYAN =9.125E-04  O&G =7.015E-03  PHEN=1.625E-04  TSS =3.993E-02
SFIDE=1.687E-04  FLIDE=1.370E-02  TI  =0.0        ZN  =7.168E-04  NITR=5.642E-03
PB   =4.275E-05  MN   =0.0        COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =1.328E-01  BOD  =4.928E-03  HMET=8.918E-03  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.4 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.672E+06  PET=4.353E+06  GAS=1.358E+07  ELEC=1.228E+07  HELEC=1.124E+06
OTH =2.364E+05  TOT=3.926E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.942E+00  NOX =2.624E+01  SOX =8.673E-01  HC=1.969E-01  CO=3.179E+00
ALD =3.362E-01  DACD=5.262E-05  HMET=1.930E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   18944.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.271E-04  TSS=1.085E+00  SFIDE=7.410E-06  FLIDE=4.218E-04
TFE =6.699E-03  DFE=2.484E-03  ZN =4.671E-06  PB   =6.194E-06  MN   =2.225E-03
COD =1.759E+00  CU =0.0        TDS=3.691E+00  BOD  =1.047E+00  HMET =2.863E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.458E+00  NOX  =1.925E-01  SOX=2.058E+00  HC  =7.174E+00  CO =1.436E+01
GFL =9.483E-02  PFL  =8.145E-02  AMM=1.031E-02  HMET=1.526E-02  ALD=1.065E-08
ORG =5.848E+00  SFIDE=3.748E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      362.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.648E-03  CYAN =9.908E-04  O&G =7.702E-03  PHEN=1.771E-04  TSS =4.049E-02
SFIDE=1.842E-04  FLIDE=1.391E-02  TI  =0.0        ZN  =7.845E-04  NITR=6.217E-03
PB   =4.599E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.298E-01  BOD  =5.423E-03  HMET=7.962E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.5 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.909E+06  PET=3.639E+06  GAS=1.105E+07  ELEC=1.049E+07  HELEC=8.444E+05
OTH =2.147E+05  TOT=3.203E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.306E+00  NOX =2.145E+01  SOX =7.414E-01  HC=1.548E-01  CO=2.655E+00
ALD =2.904E-01  DACD=2.857E-05  HMET=1.532E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    15479.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.197E-04  TSS=9.309E-01  SFIDE=5.145E-06  FLIDE=3.645E-04
TFE =5.476E-03  DFE=2.118E-03  ZN =3.310E-06  PB   =4.193E-06  MN   =1.820E-03
COD =1.520E+00  CU =0.0        TDS=3.189E+00  BOD  =9.043E-01  HMET =2.354E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.746E+00  NOX  =1.663E-01  SOX=1.715E+00  HC  =6.146E+00  CO =1.177E+01
GFL =8.830E-02  PFL  =7.612E-02  AMM=6.837E-03  HMET=1.076E-02  ALD=1.065E-08
ORG =5.050E+00  SFIDE=3.082E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      309.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.798E-03  CYAN =8.459E-04  O&G =6.396E-03  PHEN=1.473E-04  TSS =3.396E-02
SFIDE=1.510E-04  FLIDE=1.173E-02  TI  =0.0        ZN  =6.576E-04  NITR=5.219E-03
PB   =3.844E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.085E-01  BOD  =4.685E-03  HMET=6.549E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.6 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.125E+07  PET=3.716E+06  GAS=1.226E+07  ELEC=1.275E+07  HELEC=1.313E+06
OTH =2.303E+05  TOT=4.152E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.016E+00  NOX =3.775E+01  SOX =9.916E-01  HC=2.993E-01  CO=4.130E+00
ALD =3.603E-01  DACD=1.286E-04  HMET=3.241E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    27230.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.764E-03  TSS=1.259E+00  SFIDE=1.368E-05  FLIDE=8.428E-04
TFE =1.113E-02  DFE=6.437E-03  ZN =1.110E-05  PB   =1.497E-05  MN   =3.201E-03
COD =1.883E+00  CU =0.0        TDS=5.781E+00  BOD  =1.126E+00  HMET =1.669E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.896E+00  NOX =2.057E-01  SOX=2.447E+00  HC  =4.943E+00  CO =2.044E+01
GFL =1.077E-01  PFL =9.185E-02  AMM=2.064E-02  HMET=3.172E-02  ALD=1.065E-08
ORG =4.997E+00  SFIDE=5.754E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      476.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.002E-01  CYAN =1.752E-02  O&G =1.835E-02  PHEN=2.713E-03  TSS =2.814E-01
SFIDE=2.102E-04  FLIDE=7.560E-02  TI  =0.0        ZN  =1.010E-03  NITR=7.952E-03
PB   =6.042E-05  MN   =0.0        COD =2.009E-02  AL  =8.465E-03  CU  =2.419E-05
TDS  =2.973E-01  BOD  =1.075E-02  HMET=1.219E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.7 Mini-Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.031E+07  PET=4.397E+06  GAS=1.500E+07  ELEC=1.376E+07  HELEC=1.777E+06
OTH =2.160E+05  TOT=4.546E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.655E+00  NOX =3.411E+01  SOX =9.447E-01  HC=2.700E-01  CO=3.816E+00
ALD =3.489E-01  DACD=1.111E-04  HMET=2.783E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   24553.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.482E-03  TSS=1.205E+00  SFIDE=1.610E-05  FLIDE=8.165E-04
TFE =1.005E-02  DFE=5.813E-03  ZN =9.759E-06  PB   =1.353E-05  MN   =2.891E-03
COD =1.824E+00  CU =0.0        TDS=6.794E+00  BOD  =1.090E+00  HMET =2.365E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.810E+00  NOX  =2.262E-01  SOX=2.474E+00  HC  =6.849E+00  CO =1.849E+01
GFL =1.601E-01  PFL  =1.384E-01  AMM=1.807E-02  HMET=2.832E-02  ALD=1.065E-08
ORG =4.849E+00  SFIDE=4.882E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     489.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.047E-02  CYAN =1.582E-02  O&G =1.806E-02  PHEN=2.463E-03  TSS =3.588E-01
SFIDE=1.923E-04  FLIDE=1.062E-01  TI  =0.0        ZN  =9.206E-04  NITR=7.252E-03
PB   =5.462E-05  MN   =0.0        COD =2.494E-02  AL  =1.276E-02  CU  =3.647E-05
TDS  =4.393E-01  BOD  =1.695E-02  HMET=1.036E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.8 Small Auto - Otto Uniform Charged Engine, Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.595E+07  PET=5.305E+06  GAS=1.451E+07  ELEC=1.448E+07  HELEC=7.465E+05
OTH =3.209E+05  TOT=5.132E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.754E+00  NOX =5.093E+01  SOX =1.336E+00  HC=4.079E-01  CO=5.568E+00
ALD =4.850E-01  DACD=1.814E-04  HMET=4.161E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36691.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.979E-03  TSS=1.696E+00  SFIDE=1.458E-05  FLIDE=1.135E-03
TFE =1.502E-02  DFE=8.684E-03  ZN =1.264E-05  PB   =1.655E-05  MN   =4.317E-03
COD =2.535E+00  CU =0.0        TDS=7.805E+00  BOD  =1.515E+00  HMET =2.264E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.218E+00  NOX  =2.772E-01  SOX=3.529E+00  HC  =6.699E+00  CO =2.758E+01
GFL =5.718E-02  PFL  =4.574E-02  AMM=2.872E-02  HMET=3.588E-02  ALD=1.065E-08
ORG =6.726E+00  SFIDE=7.327E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      562.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.352E-01  CYAN =2.363E-02  O&G =2.482E-02  PHEN=3.658E-03  TSS =2.695E-01
SFIDE=2.798E-04  FLIDE=4.953E-02  TI  =0.0        ZN  =1.366E-03  NITR=1.078E-02
PB   =8.122E-05  MN   =0.0        COD =2.136E-02  AL  =6.655E-03  CU  =1.901E-05
TDS  =3.938E-01  BOD  =1.459E-02  HMET=1.661E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.9 Small Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.395E+06  PET=4.479E+06  GAS=1.414E+07  ELEC=1.314E+07  HELEC=1.308E+06
OTH =2.470E+05  TOT=4.272E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.927E+00  NOX =3.519E+01  SOX =1.024E+00  HC=2.684E-01  CO=4.022E+00
ALD =3.838E-01  DACD=9.110E-05  HMET=2.759E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   25294.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.879E-03  TSS=1.310E+00  SFIDE=1.454E-05  FLIDE=8.982E-04
TFE =1.037E-02  DFE=5.994E-03  ZN =9.025E-06  PB   =1.238E-05  MN   =2.985E-03
COD =2.007E+00  CU =0.0        TDS=7.446E+00  BOD  =1.199E+00  HMET =2.554E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.875E+00  NOX  =2.480E-01  SOX=2.593E+00  HC  =7.383E+00  CO =1.919E+01
GFL =1.117E-01  PFL  =9.514E-02  AMM=1.604E-02  HMET=2.627E-02  ALD=1.065E-08
ORG =5.478E+00  SFIDE=4.995E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      466.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.325E-02  CYAN =1.632E-02  O&G =1.940E-02  PHEN=2.554E-03  TSS =3.778E-01
SFIDE=2.092E-04  FLIDE=8.226E-02  TI  =0.0        ZN  =1.015E-03  NITR=8.016E-03
PB   =5.979E-05  MN   =0.0        COD =3.447E-02  AL  =1.990E-02  CU  =5.686E-05
TDS  =4.733E-01  BOD  =1.849E-02  HMET=1.060E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.10 Small Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.250E+06  PET=4.021E+06  GAS=1.738E+07  ELEC=1.948E+07  HELEC=1.193E+06
OTH =1.033E+06  TOT=5.148E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.986E+00  NOX =2.675E+01  SOX =8.646E-01  HC=1.985E-01  CO=3.207E+00
ALD =3.333E-01  DACD=5.091E-05  HMET=2.642E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19381.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.677E-04  TSS=1.080E+00  SFIDE=1.554E-05  FLIDE=4.182E-04
TFE =6.826E-03  DFE=2.549E-03  ZN =8.106E-06  PB   =1.158E-05  MN   =2.268E-03
COD =1.744E+00  CU =0.0        TDS=3.659E+00  BOD  =1.040E+00  HMET =3.560E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.480E+00  NOX  =1.928E-01  SOX=2.127E+00  HC  =7.274E+00  CO =1.463E+01
GFL =1.341E-01  PFL  =1.163E-01  AMM=1.022E-02  HMET=2.673E-02  ALD=1.065E-08
ORG =5.810E+00  SFIDE=4.661E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      407.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.739E-03  CYAN =1.017E-03  O&G =7.813E-03  PHEN=1.810E-04  TSS =4.441E-02
SFIDE=1.879E-04  FLIDE=1.524E-02  TI  =0.0        ZN  =7.983E-04  NITR=6.285E-03
PB   =4.760E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.476E-01  BOD  =5.493E-03  HMET=9.893E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.11 Small Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.532E+06  PET=4.845E+06  GAS=1.511E+07  ELEC=1.365E+07  HELEC=1.247E+06
OTH =2.627E+05  TOT=4.365E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.387E+00  NOX =2.919E+01  SOX =9.657E-01  HC=2.189E-01  CO=3.538E+00
ALD =3.744E-01  DACD=5.814E-05  HMET=2.138E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   21067.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.719E-04  TSS=1.208E+00  SFIDE=8.122E-06  FLIDE=4.698E-04
TFE =7.450E-03  DFE=2.765E-03  ZN =5.149E-06  PB   =6.812E-06  MN   =2.474E-03
COD =1.959E+00  CU =0.0        TDS=4.111E+00  BOD  =1.166E+00  HMET =3.177E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.064E+00  NOX  =2.143E-01  SOX=2.289E+00  HC  =7.986E+00  CO =1.597E+01
GFL =1.052E-01  PFL  =9.035E-02  AMM=1.143E-02  HMET=1.681E-02  ALD=1.065E-08
ORG =6.513E+00  SFIDE=4.159E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     403.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.169E-03  CYAN =1.103E-03  O&G =8.568E-03  PHEN=1.970E-04  TSS =4.501E-02
SFIDE=2.049E-04  FLIDE=1.546E-02  TI  =0.0        ZN  =8.728E-04  NITR=6.918E-03
PB   =5.115E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.442E-01  BOD  =6.038E-03  HMET=8.835E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

There is no Table B.12

Table B.13 Small Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.247E+07  PET=4.123E+06  GAS=1.355E+07  ELEC=1.408E+07  HELEC=1.435E+06
OTH =2.548E+05  TOT=4.591E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.565E+00  NOX =4.183E+01  SOX =1.102E+00  HC=3.311E-01  CO=4.582E+00
ALD =4.007E-01  DACD=1.413E-04  HMET=3.568E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30168.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.170E-03  TSS=1.400E+00  SFIDE=1.485E-05  FLIDE=9.374E-04
TFE =1.234E-02  DFE=7.132E-03  ZN =1.213E-05  PB   =1.632E-05  MN   =3.547E-03
COD =2.094E+00  CU =0.0        TDS=6.428E+00  BOD  =1.253E+00  HMET =1.851E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.606E+00  NOX  =2.287E-01  SOX=2.712E+00  HC  =5.488E+00  CO =2.265E+01
GFL =1.178E-01  PFL  =1.004E-01  AMM=2.273E-02  HMET=3.464E-02  ALD=1.065E-08
ORG =5.558E+00  SFIDE=6.356E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      527.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.110E-01  CYAN =1.941E-02  O&G =2.035E-02  PHEN=3.007E-03  TSS =3.097E-01
SFIDE=2.335E-04  FLIDE=8.290E-02  TI  =0.0        ZN  =1.121E-03  NITR=8.828E-03
PB   =6.703E-05  MN   =0.0        COD =2.216E-02  AL  =9.257E-03  CU  =2.645E-05
TDS  =3.294E-01  BOD  =1.194E-02  HMET=1.346E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.14 Small Auto - Otto Uniform Charged, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.141E+07  PET=4.879E+06  GAS=1.658E+07  ELEC=1.518E+07  HELEC=1.948E+06
OTH =2.389E+05  TOT=5.025E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.161E+00  NOX =3.775E+01  SOX =1.050E+00  HC=2.982E-01  CO=4.231E+00
ALD =3.882E-01  DACD=1.214E-04  HMET=3.053E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    27171.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.078E-03  TSS=1.339E+00  SFIDE=1.743E-05  FLIDE=9.083E-04
TFE =1.113E-02  DFE=6.434E-03  ZN =1.063E-05  PB   =1.470E-05  MN   =3.200E-03
COD =2.029E+00  CU =0.0        TDS=7.554E+00  BOD  =1.213E+00  HMET =2.624E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.606E+00  NOX  =2.515E-01  SOX=2.740E+00  HC  =7.603E+00  CO =2.047E+01
GFL =1.756E-01  PFL  =1.518E-01  AMM=1.981E-02  HMET=3.082E-02  ALD=1.065E-08
ORG =5.415E+00  SFIDE=5.374E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      540.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.001E-01  CYAN =1.751E-02  O&G =2.003E-02  PHEN=2.727E-03  TSS =3.948E-01
SFIDE=2.135E-04  FLIDE=1.166E-01  TI  =0.0        ZN  =1.021E-03  NITR=8.048E-03
PB   =6.056E-05  MN   =0.0        COD =2.749E-02  AL  =1.399E-02  CU  =3.997E-05
TDS  =4.872E-01  BOD  =1.883E-02  HMET=1.140E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.15 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 1980, All technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.094E+07  PET=7.004E+06  GAS=1.909E+07  ELEC=1.904E+07  HELEC=9.652E+05
OTH =4.180E+05  TOT=6.747E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.888E+00  NOX =6.669E+01  SOX =1.767E+00  HC=5.307E-01  CO=7.322E+00
ALD =6.437E-01  DACD=2.297E-04  HMET=5.346E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    48035.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.528E-03  TSS=2.245E+00  SFIDE=1.781E-05  FLIDE=1.506E-03
TFE =1.967E-02  DFE=1.137E-02  ZN =1.588E-05  PB   =2.056E-05  MN   =5.653E-03
COD =3.364E+00  CU =0.0        TDS=1.034E+01  BOD  =2.011E+00  HMET =2.977E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.437E+00  NOX  =3.675E-01  SOX=4.605E+00  HC  =8.827E+00  CO =3.614E+01
GFL =7.408E-02  PFL  =5.914E-02  AMM=3.673E-02  HMET=4.494E-02  ALD=1.065E-08
ORG =8.927E+00  SFIDE=9.503E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      736.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.770E-01  CYAN =3.094E-02  O&G =3.265E-02  PHEN=4.796E-03  TSS =3.520E-01
SFIDE=3.701E-04  FLIDE=6.454E-02  TI  =0.0        ZN  =1.800E-03  NITR=1.422E-02
PB   =1.069E-04  MN   =0.0        COD =2.807E-02  AL  =8.605E-03  CU  =2.459E-05
TDS  =5.167E-01  BOD  =1.928E-02  HMET=2.153E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL =0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0         TOT=0.0
```

Table B.16 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.225E+07  PET=5.883E+06  GAS=1.843E+07  ELEC=1.702E+07  HELEC=1.659E+06
OTH =3.204E+05  TOT=5.558E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.465E+00  NOX =4.595E+01  SOX =1.350E+00  HC=3.485E-01  CO=5.275E+00
ALD =5.072E-01  DACD=1.143E-04  HMET=3.509E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33023.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.702E-03  TSS=1.728E+00  SFIDE=1.767E-05  FLIDE=1.187E-03
TFE =1.354E-02  DFE=7.827E-03  ZN =1.121E-05  PB   =1.523E-05  MN   =3.898E-03
COD =2.652E+00  CU =0.0        TDS=9.828E+00  BOD  =1.584E+00  HMET =3.353E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.886E+00  NOX  =3.274E-01  SOX=3.392E+00  HC  =9.708E+00  CO =2.507E+01
GFL =1.420E-01  PFL  =1.207E-01  AMM=2.042E-02  HMET=3.255E-02  ALD=1.065E-08
ORG =7.224E+00  SFIDE=6.419E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      605.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.218E-01  CYAN =2.132E-02  O&G =2.544E-02  PHEN=3.339E-03  TSS =4.849E-01
SFIDE=2.755E-04  FLIDE=1.050E-01  TI  =0.0        ZN  =1.331E-03  NITR=1.052E-02
PB   =7.831E-05  MN   =0.0        COD =4.430E-02  AL  =2.525E-02  CU  =7.215E-05
TDS  =6.204E-01  BOD  =2.436E-02  HMET=1.362E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.17 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.071E+07  PET=5.253E+06  GAS=2.221E+07  ELEC=2.463E+07  HELEC=1.518E+06
OTH =1.268E+06  TOT=6.574E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.210E+00  NOX =3.483E+01  SOX =1.134E+00  HC=2.579E-01  CO=4.190E+00
ALD =4.380E-01  DACD=6.449E-05  HMET=3.328E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25230.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.301E-04  TSS=1.417E+00  SFIDE=1.879E-05  FLIDE=5.496E-04
TFE =8.890E-03  DFE=3.330E-03  ZN =9.982E-06  PB   =1.415E-05  MN   =2.954E-03
COD =2.292E+00  CU =0.0        TDS=4.809E+00  BOD  =1.367E+00  HMET =4.533E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.341E+00  NOX  =2.530E-01  SOX=2.771E+00  HC  =9.520E+00  CO =1.905E+01
GFL =1.706E-01  PFL  =1.479E-01  AMM=1.311E-02  HMET=3.286E-02  ALD=1.065E-08
ORG =7.633E+00  SFIDE=5.935E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      526.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.171E-03  CYAN =1.328E-03  O&G =1.019E-02  PHEN=2.360E-04  TSS =5.745E-02
SFIDE=2.447E-04  FLIDE=1.974E-02  TI  =0.0        ZN  =1.041E-03  NITR=8.205E-03
PB   =6.196E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.901E-01  BOD  =7.196E-03  HMET=1.260E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.18 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.131E+07  PET=6.471E+06  GAS=2.005E+07  ELEC=1.802E+07  HELEC=1.620E+06
OTH =3.461E+05  TOT=5.783E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.846E+00  NOX =3.870E+01  SOX =1.293E+00  HC=2.887E-01  CO=4.712E+00
ALD =5.023E-01  DACD=7.311E-05  HMET=2.749E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27930.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.935E-04  TSS=1.618E+00  SFIDE=9.547E-06  FLIDE=6.303E-04
TFE =9.880E-03  DFE=3.691E-03  ZN =6.346E-06  PB   =8.244E-06  MN   =3.282E-03
COD =2.628E+00  CU =0.0        TDS=5.515E+00  BOD  =1.564E+00  HMET =4.140E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.979E+00  NOX  =2.872E-01  SOX=3.042E+00  HC  =1.067E+01  CO =2.119E+01
GFL =1.368E-01  PFL  =1.174E-01  AMM=1.471E-02  HMET=2.065E-02  ALD=1.065E-08
ORG =8.736E+00  SFIDE=5.420E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     532.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.855E-03  CYAN =1.472E-03  O&G =1.139E-02  PHEN=2.619E-04  TSS =5.953E-02
SFIDE=2.718E-04  FLIDE=2.044E-02  TI  =0.0        ZN  =1.161E-03  NITR=9.211E-03
PB   =6.797E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.903E-01  BOD  =8.081E-03  HMET=1.152E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.19 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.811E+06  PET=5.443E+06  GAS=1.644E+07  ELEC=1.551E+07  HELEC=1.225E+06
OTH =3.194E+05  TOT=4.757E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.954E+00  NOX =3.209E+01  SOX =1.113E+00  HC=2.314E-01  CO=3.979E+00
ALD =4.365E-01  DACD=4.189E-05  HMET=2.230E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23148.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.574E-04  TSS=1.398E+00  SFIDE=6.877E-06  FLIDE=5.478E-04
TFE =8.191E-03  DFE=3.174E-03  ZN =4.653E-06  PB   =5.789E-06  MN   =2.722E-03
COD =2.284E+00  CU =0.0        TDS=4.793E+00  BOD  =1.359E+00  HMET =3.462E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.003E+00  NOX  =2.496E-01  SOX=2.564E+00  HC  =9.212E+00  CO =1.760E+01
GFL =1.282E-01  PFL  =1.104E-01  AMM=1.013E-02  HMET=1.508E-02  ALD=1.065E-08
ARG =7.589E+00  SFIDE=4.532E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     458.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.681E-03  CYAN =1.267E-03  O&G =9.573E-03  PHEN=2.204E-04  TSS =5.054E-02
SFIDE=2.259E-04  FLIDE=1.744E-02  TI  =0.0        ZN  =9.841E-04  NITR=7.814E-03
PB   =5.746E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.612E-01  BOD  =7.026E-03  HMET=9.631E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.20 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.561E+07  PET=5.239E+06  GAS=1.635E+07  ELEC=1.676E+07  HELEC=1.466E+06
OTH =3.110E+05  TOT=5.575E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.060E+00  NOX =5.209E+01  SOX =1.436E+00  HC=4.034E-01  CO=5.799E+00
ALD =5.251E-01  DACD=1.542E-04  HMET=4.043E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37520.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.182E-03  TSS=1.817E+00  SFIDE=1.327E-05  FLIDE=1.229E-03
TFE =1.536E-02  DFE=8.879E-03  ZN =1.226E-05  PB   =1.568E-05  MN   =4.418E-03
COD =2.745E+00  CU =0.0        TDS=8.388E+00  BOD  =1.640E+00  HMET =2.344E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.884E+00  NOX  =2.985E-01  SOX=3.387E+00  HC  =7.007E+00  CO =2.827E+01
AFL =1.215E-01  PFL  =1.026E-01  AMM=2.591E-02  HMET=3.459E-02  ALD=1.065E-08
ORG =7.284E+00  SFIDE=7.581E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      637.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.382E-01  CYAN =2.417E-02  O&G =2.577E-02  PHEN=3.759E-03  TSS =3.502E-01
SFIDE=3.008E-04  FLIDE=8.851E-02  TI  =0.0        ZN  =1.429E-03  NITR=1.129E-02
PB   =8.486E-05  MN   =0.0        COD =2.583E-02  AL  =9.455E-03  CU  =2.701E-05
TDS  =4.107E-01  BOD  =1.544E-02  HMET=1.606E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.21 Medium Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.334E+07  PET=5.976E+06  GAS=1.866E+07  ELEC=1.626E+07  HELEC=1.728E+06
OTH =2.706E+05  TOT=5.624E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.226E+00  NOX =4.352E+01  SOX =1.324E+00  HC=3.250E-01  CO=5.074E+00
ALD =5.023E-01  DACD=9.482E-05  HMET=2.779E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   31238.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.289E-03  TSS=1.698E+00  SFIDE=9.405E-06  FLIDE=1.176E-03
TFE =1.282E-02  DFE=7.411E-03  ZN =7.595E-06  PB   =9.369E-06  MN   =3.692E-03
COD =2.627E+00  CU =0.0        TDS=9.662E+00  BOD  =1.567E+00  HMET =3.199E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.889E+00  NOX  =3.223E-01  SOX=3.218E+00  HC  =9.399E+00  CO =2.372E+01
GFL =1.573E-01  PFL  =1.346E-01  AMM=1.785E-02  HMET=2.140E-02  ALD=1.065E-08
MRG =6.988E+00  SFIDE=5.401E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     589.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.153E-01  CYAN =2.019E-02  O&G =2.413E-02  PHEN=3.174E-03  TSS =3.933E-01
SFIDE=2.671E-04  FLIDE=1.082E-01  TI  =0.0        ZN  =1.247E-03  NITR=9.891E-03
PB   =7.300E-05  MN   =0.0        COD =2.875E-02  AL  =1.241E-02  CU  =3.546E-05
TDS  =5.873E-01  BOD  =2.373E-02  HMET=1.147E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.22 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.496E+07  PET=8.390E+06  GAS=2.279E+07  ELEC=2.273E+07  HELEC=1.135E+06
OTH =4.947E+05  TOT=8.051E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.062E+01  NOX =7.930E+01  SOX =2.120E+00  HC=6.275E-01  CO=8.740E+00
ALD =7.746E-01  DACD=2.647E-04  HMET=6.248E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    57107.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.772E-03  TSS=2.695E+00  SFIDE=1.980E-05  FLIDE=1.812E-03
TFE =2.338E-02  DFE=1.352E-02  ZN =1.816E-05  PB   =2.325E-05  MN   =6.723E-03
COD =4.048E+00  CU =0.0        TDS=1.243E+01  BOD  =2.419E+00  HMET =3.553E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.121E+01  NOX  =4.418E-01  SOX=5.459E+00  HC  =1.055E+01  CO =4.300E+01
GFL =8.724E-02  PFL  =6.951E-02  AMM=4.275E-02  HMET=5.125E-02  ALD=1.065E-08
ORG =1.074E+01  SFIDE=1.127E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      876.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.104E-01  CYAN =3.679E-02  O&G =3.897E-02  PHEN=5.708E-03  TSS =4.174E-01
SFIDE=4.440E-04  FLIDE=7.641E-02  TI  =0.0        ZN  =2.153E-03  NITR=1.701E-02
PB   =1.277E-04  MN   =0.0        COD =3.350E-02  AL  =1.012E-02  CU  =2.890E-05
TDS  =6.156E-01  BOD  =2.312E-02  HMET=2.536E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.23 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.468E+07  PET=7.089E+06  GAS=2.207E+07  ELEC=2.027E+07  HELEC=1.941E+06
OTH =3.820E+05  TOT=6.645E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.783E+00  NOX =5.511E+01  SOX =1.631E+00  HC=4.160E-01  CO=6.347E+00
ALD =6.143E-01  DACD=1.322E-04  HMET=4.113E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39591.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.261E-03  TSS=2.089E+00  SFIDE=1.985E-05  FLIDE=1.438E-03
TFE =1.623E-02  DFE=9.386E-03  ZN =1.285E-05  PB   =1.731E-05  MN   =4.675E-03
COD =3.213E+00  CU =0.0        TDS=1.189E+01  BOD  =1.918E+00  HMET =4.038E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.056E+01  NOX  =3.962E-01  SOX=4.074E+00  HC  =1.171E+01  CO =3.008E+01
GFL =1.662E-01  PFL  =1.412E-01  AMM=2.395E-02  HMET=3.725E-02  ALD=1.065E-08
ORG =8.734E+00  SFIDE=7.593E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      723.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.460E-01  CYAN =2.556E-02  O&G =3.060E-02  PHEN=4.008E-03  TSS =5.729E-01
SFIDE=3.326E-04  FLIDE=1.234E-01  TI  =0.0        ZN  =1.602E-03  NITR=1.267E-02
PB   =9.413E-05  MN   =0.0        COD =5.239E-02  AL  =2.953E-02  CU  =8.438E-05
TDS  =7.464E-01  BOD  =2.943E-02  HMET=1.611E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.24 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.293E+07  PET=6.378E+06  GAS=2.645E+07  ELEC=2.905E+07  HELEC=1.800E+06
OTH =1.455E+06  TOT=7.825E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.326E+00  NOX =4.217E+01  SOX =1.382E+00  HC=3.116E-01  CO=5.088E+00
ALD =5.344E-01  DACD=7.621E-05  HMET=3.913E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30534.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.643E-04  TSS=1.727E+00  SFIDE=2.126E-05  FLIDE=6.705E-04
TFE =1.076E-02  DFE=4.043E-03  ZN =1.149E-05  PB   =1.617E-05  MN   =3.577E-03
COD =2.796E+00  CU =0.0        TDS=5.867E+00  BOD  =1.667E+00  HMET =5.382E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.996E+00  NOX  =3.083E-01  SOX=3.355E+00  HC  =1.157E+01  CO =2.307E+01
GFL =2.024E-01  PFL  =1.754E-01  AMM=1.567E-02  HMET=3.776E-02  ALD=1.065E-08
ORG =9.309E+00  SFIDE=7.046E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      632.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.470E-03  CYAN =1.613E-03  O&G =1.235E-02  PHEN=2.860E-04  TSS =6.915E-02
SFIDE=2.963E-04  FLIDE=2.379E-02  TI  =0.0        ZN  =1.262E-03  NITR=9.954E-03
PB   =7.497E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.280E-01  BOD  =8.755E-03  HMET=1.496E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.25 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.328E+07  PET=7.612E+06  GAS=2.354E+07  ELEC=2.112E+07  HELEC=1.891E+06
OTH =4.056E+05  TOT=6.787E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.873E+00  NOX =4.544E+01  SOX =1.522E+00  HC=3.383E-01  CO=5.539E+00
ALD =5.917E-01  DACD=8.444E-05  HMET=3.196E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    32786.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.855E-04  TSS=1.905E+00  SFIDE=1.078E-05  FLIDE=7.425E-04
TFE =1.160E-02  DFE=4.342E-03  ZN =7.283E-06  PB   =9.403E-06  MN   =3.853E-03
COD =3.096E+00  CU =0.0        TDS=6.497E+00  BOD  =1.842E+00  HMET =4.835E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.345E+00  NOX  =3.382E-01  SOX=3.573E+00  HC  =1.256E+01  CO =2.488E+01
GFL =1.597E-01  PFL  =1.370E-01  AMM=1.712E-02  HMET=2.368E-02  ALD=1.065E-08
ORG =1.029E+01  SFIDE=6.330E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      624.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.047E-03  CYAN =1.732E-03  O&G =1.338E-02  PHEN=3.077E-04  TSS =6.984E-02
SFIDE=3.191E-04  FLIDE=2.397E-02  TI  =0.0        ZN  =1.365E-03  NITR=1.083E-02
PB   =7.984E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.230E-01  BOD  =9.513E-03  HMET=1.345E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.26 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.149E+07  PET=7.115E+06  GAS=2.138E+07  ELEC=2.005E+07  HELEC=1.555E+06
OTH =4.154E+05  TOT=6.179E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.489E+00  NOX =4.195E+01  SOX =1.461E+00  HC=3.021E-01  CO=5.211E+00
ALD =5.732E-01  DACD=5.372E-05  HMET=2.839E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   30257.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.724E-04  TSS=1.835E+00  SFIDE=7.980E-06  FLIDE=7.194E-04
TFE =1.071E-02  DFE=4.156E-03  ZN =5.715E-06  PB   =6.971E-06  MN   =3.559E-03
COD =3.000E+00  CU =0.0        TDS=6.295E+00  BOD  =1.784E+00  HMET =4.452E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.039E+00  NOX  =3.275E-01  SOX=3.352E+00  HC  =1.207E+01  CO =2.302E+01
GFL =1.629E-01  PFL  =1.402E-01  AMM=1.313E-02  HMET=1.846E-02  ALD=1.065E-08
ORG =9.964E+00  SFIDE=5.829E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      595.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.427E-03  CYAN =1.659E-03  O&G =1.252E-02  PHEN=2.883E-04  TSS =6.576E-02
SFIDE=2.954E-04  FLIDE=2.266E-02  TI  =0.0        ZN  =1.287E-03  NITR=1.023E-02
PB   =7.509E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.093E-01  BOD  =9.208E-03  HMET=1.239E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.27 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.951E+07  PET=6.497E+06  GAS=2.085E+07  ELEC=2.154E+07  HELEC=2.057E+06
OTH =3.942E+05  TOT=7.087E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.763E+00  NOX =6.531E+01  SOX =1.751E+00  HC=5.119E-01  CO=7.207E+00
ALD =6.405E-01  OACD=2.081E-04  HMET=5.345E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   47073.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.504E-03  TSS=2.227E+00  SFIDE=2.020E-05  FLIDE=1.499E-03
TEF =1.926E-02  DPE=1.113E-02  ZN =1.731E-05  PB   =2.283E-05  MN   =5.538E-03
COD =3.348E+00  CU =0.0        TDS=1.025E+01  BOD  =2.002E+00  HMET =2.912E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.154E+01  NOX  =3.649E-01  SOX=4.240E+00  HC  =8.666E+00  CO =3.540E+01
GFL =1.696E-01  PFL  =1.440E-01  AMM=3.411E-02  HMET=4.920E-02  ALD=1.065E-08
ORG =8.884E+00  SFIDE=9.783E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      811.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.733E-01  CYAN =3.030E-02  O&G =3.202E-02  PHEN=4.703E-03  TSS =4.633E-01
SFIDE=3.703E-04  FLIDE=1.210E-01  TI  =0.0        ZN  =1.769E-03  NITR=1.395E-02
PB   =1.054E-04  MN   =0.0        COD =3.358E-02  AL  =1.327E-02  CU  =3.791E-05
TDS  =5.146E-01  BOD  =1.897E-02  HMET=2.062E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.28 Large Auto - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.719E+07  PET=7.516E+06  GAS=2.454E+07  ELEC=2.197E+07  HELEC=2.602E+06
OTH =3.546E+05  TOT=7.418E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.892E+00  NOX =5.650E+01  SOX =1.640E+00  HC=4.349E-01  CO=6.452E+00
ALD =6.142E-01  DACD=1.543E-04  HMET=4.121E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    40616.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.268E-03  TSS=2.098E+00  SFIDE=1.962E-05  FLIDE=1.438E-03
TFE =1.665E-02  DFE=9.625E-03  ZN =1.309E-05  PB   =1.741E-05  MN   =4.792E-03
COD =3.211E+00  CU =0.0        TDS=1.188E+01  BOD  =1.917E+00  HMET =4.033E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.226E+01  NOX  =3.960E-01  SOX=4.137E+00  HC  =1.176E+01  CO =3.071E+01
GFL =2.354E-01  PFL  =2.027E-01  AMM=2.663E-02  HMET=3.757E-02  ALD=1.065E-08
ORG =8.557E+00  SFIDE=7.562E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      788.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.498E-01  CYAN =2.621E-02  O&G =3.061E-02  PHEN=4.100E-03  TSS =5.535E-01
SFIDE=3.323E-04  FLIDE=1.586E-01  TI  =0.0        ZN  =1.571E-03  NITR=1.242E-02
PB   =9.257E-05  MN   =0.0        COD =3.937E-02  AL  =1.869E-02  CU  =5.339E-05
TDS  =7.447E-01  BOD  =2.941E-02  HMET=1.605E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.29 Van - Otto Uniform Charged Engine, Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.486E+07  PET=8.332E+06  GAS=2.268E+07  ELEC=2.262E+07  HELEC=1.140E+06
OTH =4.949E+05  TOT=8.014E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.056E+01  NOX =7.910E+01  SOX =2.103E+00  HC=6.281E-01  CO=8.698E+00
ALD =7.672E-01  DACD=2.691E-04  HMET=6.297E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    56971.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.747E-03  TSS=2.673E+00  SFIDE=2.057E-05  FLIDE=1.795E-03
TFE =2.333E-02  DFE=1.349E-02  ZN =1.854E-05  PB   =2.390E-05  MN   =6.706E-03
COD =4.009E+00  CU =0.0        TDS=1.232E+01  BOD  =2.397E+00  HMET =3.536E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.119E+01  NOX  =4.378E-01  SOX=5.456E+00  HC  =1.049E+01  CO =4.287E+01
GFL =8.753E-02  PFL  =6.982E-02  AMM=4.319E-02  HMET=5.242E-02  ALD=1.065E-08
ORG =1.064E+01  SFIDE=1.128E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      874.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.099E-01  CYAN =3.670E-02  O&G =3.879E-02  PHEN=5.690E-03  TSS =4.170E-01
SFIDE=4.406E-04  FLIDE=7.642E-02  TI  =0.0        ZN  =2.140E-03  NITR=1.691E-02
PB   =1.270E-04  MN   =0.0        COD =3.335E-02  AL  =1.016E-02  CU  =2.903E-05
TDS  =6.133E-01  BOD  =2.295E-02  HMET=2.544E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.30 Van - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.628E+07  PET=7.752E+06  GAS=2.451E+07  ELEC=2.279E+07  HELEC=2.278E+06
OTH =4.284E+05  TOT=7.406E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.530E+00  NOX =6.097E+01  SOX =1.771E+00  HC=4.655E-01  CO=6.964E+00
ALD =6.634E-01  DACD=1.590E-04  HMET=4.804E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   43829.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.018E-02  TSS=2.266E+00  SFIDE=2.551E-05  FLIDE=1.553E-03
TFE =1.796E-02  DFE=1.039E-02  ZN =1.578E-05  PB   =2.168E-05  MN   =5.171E-03
COD =3.469E+00  CU =0.0        TDS=1.288E+01  BOD  =2.073E+00  HMET =4.421E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.193E+01  NOX  =4.289E-01  SOX=4.492E+00  HC  =1.277E+01  CO =3.325E+01
GFL =1.946E-01  PFL  =1.657E-01  AMM=2.791E-02  HMET=4.594E-02  ALD=1.065E-08
OPG =9.474E+00  SFIDE=8.680E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     808.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.616E-01  CYAN =2.828E-02  O&G =3.360E-02  PHEN=4.425E-03  TSS =6.566E-01
SFIDE=3.620E-04  FLIDE=1.431E-01  TI  =0.0        ZN  =1.757E-03  NITR=1.388E-02
PB   =1.035E-04  MN   =0.0        COD =5.990E-02  AL  =3.466E-02  CU  =9.903E-05
TDS  =8.195E-01  BOD  =3.198E-02  HMET=1.842E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.31 Van - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.540E+07  PET=7.629E+06  GAS=3.120E+07  ELEC=3.402E+07  HELEC=2.116E+06
OTH =1.669E+06  TOT=9.226E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.568E+00  NOX =5.034E+01  SOX =1.657E+00  HC=3.715E-01  CO=6.087E+00
ALD =6.415E-01  DACD=8.937E-05  HMET=4.572E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36443.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.116E-03  TSS=2.072E+00  SFIDE=2.410E-05  FLIDE=8.049E-04
TFE =1.285E-02  DFE=4.836E-03  ZN =1.321E-05  PB   =1.848E-05  MN   =4.270E-03
COD =3.356E+00  CU =0.0        TDS=7.043E+00  BOD  =2.001E+00  HMET =6.334E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.185E+01  NOX  =3.697E-01  SOX=4.005E+00  HC  =1.386E+01  CO =2.754E+01
GFL =2.381E-01  PFL  =2.062E-01  AMM=1.852E-02  HMET=4.334E-02  ALD=1.065E-08
OPG =1.117E+01  SFIDE=8.292E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      752.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.918E-03  CYAN =1.930E-03  O&G =1.476E-02  PHEN=3.417E-04  TSS =8.221E-02
SFIDE=3.538E-04  FLIDE=2.830E-02  TI  =0.0        ZN  =1.508E-03  NITR=1.190E-02
PB   =8.948E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.703E-01  BOD  =1.049E-02  HMET=1.761E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.32 Van - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.519E+07  PET=8.549E+06  GAS=2.687E+07  ELEC=2.443E+07  HELEC=2.276E+06
OTH =4.714E+05  TOT=7.780E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.761E+00  NOX =5.196E+01  SOX =1.699E+00  HC=3.923E-01  CO=6.263E+00
ALD =6.568E-01  DACD=1.103E-04  HMET=3.955E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   37521.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.948E-04  TSS=2.123E+00  SFIDE=1.653E-05  FLIDE=8.241E-04
TFE =1.326E-02  DFE=4.882E-03  ZN =9.980E-06  PB   =1.346E-05  MN   =4.405E-03
COD =3.436E+00  CU =0.0        TDS=7.211E+00  BOD  =2.046E+00  HMET =5.778E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.090E+01  NOX  =3.765E-01  SOX=4.065E+00  HC  =1.408E+01  CO =2.843E+01
GFL =1.919E-01  PFL  =1.649E-01  AMM=2.109E-02  HMET=3.269E-02  ALD=1.065E-08
ORG =1.143E+01  SFIDE=7.565E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     721.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.204E-03  CYAN =1.947E-03  O&G =1.521E-02  PHEN=3.495E-04  TSS =8.040E-02
SFIDE=3.646E-04  FLIDE=2.764E-02  TI  =0.0        ZN  =1.547E-03  NITR=1.225E-02
PB   =9.085E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.585E-01  BOD  =1.062E-02  HMET=1.607E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.33 Van - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.331E+07  PET=8.124E+06  GAS=2.508E+07  ELEC=2.432E+07  HELEC=2.077E+06
OTH =4.880E+05  TOT=7.311E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.328E+00  NOX =4.787E+01  SOX =1.633E+00  HC=3.469E-01  CO=5.887E+00
ALD =6.375E-01  DACD=6.806E-05  HMET=3.730E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34568.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.189E-04  TSS=2.048E+00  SFIDE=1.564E-05  FLIDE=8.001E-04
TFE =1.222E-02  DFE=4.701E-03  ZN =8.902E-06  PB   =1.181E-05  MN   =4.061E-03
COD =3.336E+00  CU =0.0        TDS=7.001E+00  BOD  =1.986E+00  HMET =5.555E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.107E+01  NOX  =3.662E-01  SOX=3.828E+00  HC  =1.361E+01  CO =2.625E+01
GFL =2.166E-01  PFL  =1.872E-01  AMM=1.574E-02  HMET=2.919E-02  ALD=1.065E-08
ORG =1.109E+01  SFIDE=7.273E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      708.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.477E-03  CYAN =1.877E-03  O&G =1.424E-02  PHEN=3.279E-04  TSS =7.712E-02
SFIDE=3.369E-04  FLIDE=2.673E-02  TI  =0.0        ZN  =1.465E-03  NITR=1.160E-02
PB   =8.594E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.481E-01  BOD  =1.036E-02  HMET=1.545E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.34 Van - Otto Uniform Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.895E+07  PET=6.421E+06  GAS=1.932E+07  ELEC=1.961E+07  HELEC=1.501E+06
OTH =3.704E+05  TOT=6.619E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.543E+00  NOX =6.296E+01  SOX =1.769E+00  HC=4.800E-01  CO=7.089E+00
ALD =6.566E-01  OACD=1.682E-04  HMET=4.562E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    45311.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.254E-03  TSS=2.258E+00  SFIDE=1.165E-05  FLIDE=1.537E-03
TFE =1.856E-02  DFE=1.073E-02  ZN =1.242E-05  PB   =1.505E-05  MN   =5.342E-03
COD =3.433E+00  CU =0.0        TDS=1.046E+01  BOD  =2.050E+00  HMET =2.866E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.024E+01  NOX  =3.724E-01  SOX=4.102E+00  HC  =8.615E+00  CO =3.421E+01
GFL =1.257E-01  PFL  =1.051E-01  AMM=2.930E-02  HMET=3.461E-02  ALD=1.065E-08
ORG =9.110E+00  SFIDE=8.883E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      753.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.669E-01  CYAN =2.922E-02  O&G =3.150E-02  PHEN=4.556E-03  TSS =3.935E-01
SFIDE=3.720E-04  FLIDE=9.459E-02  TI  =0.0        ZN  =1.754E-03  NITR=1.389E-02
PB   =1.037E-04  MN   =0.0        COD =2.973E-02  AL  =9.683E-03  CU  =2.767E-05
TDS  =4.968E-01  BOD  =1.915E-02  HMET=1.882E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.35 Van - Otto Uniform Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.693E+07  PET=7.600E+06  GAS=2.366E+07  ELEC=2.059E+07  HELEC=2.172E+06
OTH =3.432E+05  TOT=7.131E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.914E+00  NOX =5.524E+01  SOX =1.685E+00  HC=4.117E-01  CO=6.449E+00
ALD =6.398E-01  DACD=1.185E-04  HMET=3.497E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39647.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.264E-03  TSS=2.162E+00  SFIDE=1.149E-05  FLIDE=1.498E-03
TFE =1.627E-02  DFE=9.406E-03  ZN =9.448E-06  PB   =1.158E-05  MN   =4.687E-03
COD =3.346E+00  CU =0.0        TDS=1.230E+01  BOD  =1.995E+00  HMET =4.068E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.124E+01  NOX  =4.104E-01  SOX=4.088E+00  HC  =1.196E+01  CO =3.011E+01
GFL =1.977E-01  PFL  =1.692E-01  AMM=2.244E-02  HMET=2.658E-02  ALD=1.065E-08
ORG =8.901E+00  SFIDE=6.823E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      747.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.463E-01  CYAN =2.562E-02  O&G =3.068E-02  PHEN=4.030E-03  TSS =4.966E-01
SFIDE=3.399E-04  FLIDE=1.362E-01  TI  =0.0        ZN  =1.586E-03  NITR=1.258E-02
PB   =9.278E-05  MN   =0.0        COD =3.637E-02  AL  =1.560E-02  CU  =4.456E-05
TDS  =7.465E-01  BOD  =3.020E-02  HMET=1.449E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.36 Mini Auto, Otto Stratified Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.787E+06  PET=4.126E+06  GAS=1.324E+07  ELEC=1.246E+07  HELEC=1.294E+06
OTH =2.336E+05  TOT=4.016E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.549E+00  NOX =3.282E+01  SOX =9.357E-01  HC=2.533E-01  CO=3.718E+00
ALD =3.486E-01  DACD=9.225E-05  HMET=2.718E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23606.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.445E-03  TSS=1.196E+00  SFIDE=1.558E-05  FLIDE=8.159E-04
TFE =9.669E-03  DFE=5.591E-03  ZN =9.312E-06  PB   =1.299E-05  MN   =2.783E-03
COD =1.823E+00  CU =0.0        TDS=6.785E+00  BOD  =1.090E+00  HMET =2.356E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.554E+00  NOX  =2.259E-01  SOX=2.410E+00  HC  =6.781E+00  CO =1.788E+01
GFL =1.103E-01  PFL  =9.416E-02  AMM=1.576E-02  HMET=2.720E-02  ALD=1.065E-08
ORG =5.001E+00  SFIDE=4.818E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      439.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.699E-02  CYAN =1.522E-02  O&G =1.795E-02  PHEN=2.377E-03  TSS =3.653E-01
SFIDE=1.918E-04  FLIDE=8.047E-02  TI  =0.0        ZN  =9.378E-04  NITR=7.395E-03
PB   =5.541E-05  MN   =0.0        COD =3.325E-02  AL  =1.969E-02  CU  =5.627E-05
TDS  =4.378E-01  BOD  =1.691E-02  HMET=1.022E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.37 Mini Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.661E+06  PET=3.685E+06  GAS=1.665E+07  ELEC=1.906E+07  HELEC=1.154E+06
OTH =1.066E+06  TOT=4.937E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.651E+00  NOX =2.467E+01  SOX =7.858E-01  HC=1.840E-01  CO=2.938E+00
ALD =3.018E-01  DACD=4.959E-05  HMET=2.600E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   17896.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.732E-04  TSS=9.798E-01  SFIDE=1.643E-05  FLIDE=3.786E-04
TFE =6.297E-03  DFE=2.335E-03  ZN =8.312E-06  PB   =1.204E-05  MN   =2.093E-03
COD =1.579E+00  CU =0.0        TDS=3.313E+00  BOD  =9.425E-01  HMET =3.434E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.122E+00  NOX  =1.752E-01  SOX=1.962E+00  HC  =6.643E+00  CO =1.349E+01
GFL =1.295E-01  PFL  =1.124E-01  AMM=9.724E-03  HMET=2.749E-02  ALD=1.065E-08
ORG =5.263E+00  SFIDE=4.495E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     381.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.372E-03  CYAN =9.314E-04  O&G =7.187E-03  PHEN=1.665E-04  TSS =4.154E-02
SFIDE=1.733E-04  FLIDE=1.422E-02  TI  =0.0        ZN  =7.342E-04  NITR=5.770E-03
PB   =4.395E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.392E-01  BOD  =5.007E-03  HMET=9.540E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.38 Mini Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=7.824E+06  PET=4.401E+06  GAS=1.384E+07  ELEC=1.259E+07  HELEC=1.173E+06
OTH =2.428E+05  TOT=4.007E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.996E+00  NOX =2.676E+01  SOX =8.746E-01  HC=2.021E-01  CO=3.225E+00
ALD =3.381E-01  DACD=5.690E-05  HMET=2.039E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19324.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.618E-04  TSS=1.093E+00  SFIDE=8.550E-06  FLIDE=4.242E-04
TFE =6.830E-03  DFE=2.513E-03  ZN =5.154E-06  PB   =6.957E-06  MN   =2.269E-03
COD =1.769E+00  CU =0.0        TDS=3.712E+00  BOD  =1.053E+00  HMET =2.978E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.618E+00  NOX  =1.938E-01  SOX=2.093E+00  HC  =7.248E+00  CO =1.464E+01
GFL =9.890E-02  PFL  =8.502E-02  AMM=1.088E-02  HMET=1.689E-02  ALD=1.065E-08
ORG =5.883E+00  SFIDE=3.899E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      371.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.740E-03  CYAN =1.002E-03  O&G =7.831E-03  PHEN=1.800E-04  TSS =4.141E-02
SFIDE=1.877E-04  FLIDE=1.423E-02  TI  =0.0        ZN  =7.967E-04  NITR=6.309E-03
PB   =4.679E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.331E-01  BOD  =5.470E-03  HMET=8.282E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.39 Mini Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.981E+06  PET=3.671E+06  GAS=1.121E+07  ELEC=1.073E+07  HELEC=8.835E+05
OTH =2.180E+05  TOT=3.257E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.326E+00  NOX =2.163E+01  SOX =7.441E-01  HC=1.564E-01  CO=2.671E+00
ALD =2.912E-01  OACD=2.953E-05  HMET=1.596E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    15616.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.399E-04  TSS=9.339E-01  SFIDE=5.880E-06  FLIDE=3.654E-04
TFE =5.523E-03  DFE=2.132E-03  ZN =3.590E-06  PB   =4.637E-06  MN   =1.835E-03
COD =1.524E+00  CU =0.0        TDS=3.197E+00  BOD  =9.068E-01  HMET =2.424E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.866E+00  NOX  =1.669E-01  SOX=1.729E+00  HC  =6.181E+00  CO =1.187E+01
GFL =9.230E-02  PFL  =7.965E-02  AMM=6.975E-03  HMET=1.171E-02  ALD=1.065E-08
OPG =5.064E+00  SFIDE=3.174E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      314.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.831E-03  CYAN =8.513E-04  O&G =6.446E-03  PHEN=1.484E-04  TSS =3.447E-02
SFIDE=1.523E-04  FLIDE=1.192E-02  TI  =0.0        ZN  =6.627E-04  NITR=5.256E-03
PB   =3.879E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.104E-01  BOD  =4.710E-03  HMET=6.743E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.40 Mini Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.157E+07  PET=3.800E+06  GAS=1.279E+07  ELEC=1.337E+07  HELEC=1.449E+06
OTH =2.393E+05  TOT=4.323E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.132E+00  NOX =3.892E+01  SOX =1.006E+00  HC=3.113E-01  CO=4.230E+00
ALD =3.637E-01  OACD=1.390E-04  HMET=3.459E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    28088.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.884E-03  TSS=1.277E+00  SFIDE=1.566E-05  FLIDE=8.506E-04
TFE =1.148E-02  DFE=6.638E-03  ZN =1.230E-05  PB   =1.682E-05  MN   =3.299E-03
COD =1.900E+00  CU =0.0        TDS=5.846E+00  BOD  =1.137E+00  HMET =1.709E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.285E+00  NOX  =2.079E-01  SOX=2.520E+00  HC  =5.045E+00  CO =2.106E+01
GFL =1.185E-01  PFL  =1.014E-01  AMM=2.199E-02  HMET=3.525E-02  ALD=1.065E-08
ORG =5.043E+00  SFIDE=6.032E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      497.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.033E-01  CYAN =1.806E-02  O&G =1.879E-02  PHEN=2.793E-03  TSS =3.007E-01
SFIDE=2.137E-04  FLIDE=8.233E-02  TI  =0.0        ZN  =1.032E-03  NITR=8.110E-03
PB   =6.188E-05  MN   =0.0        COD =2.124E-02  AL  =9.346E-03  CU  =2.670E-05
TDS  =3.064E-01  BOD  =1.091E-02  HMET=1.278E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.41 Mini Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.053E+07  PET=4.463E+06  GAS=1.539E+07  ELEC=1.420E+07  HELEC=1.872E+06
OTH =2.215E+05  TOT=4.668E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.734E+00  NOX =3.490E+01  SOX =9.548E-01  HC=2.782E-01  CO=3.884E+00
ALD =3.513E-01  OACD=1.183E-04  HMET=2.924E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   25129.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.580E-03  TSS=1.217E+00  SFIDE=1.757E-05  FLIDE=8.221E-04
TFE =1.029E-02  DFE=5.948E-03  ZN =1.046E-05  PB   =1.462E-05  MN   =2.958E-03
COD =1.836E+00  CU =0.0        TDS=6.853E+00  BOD  =1.098E+00  HMET =2.402E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.097E+00  NOX  =2.281E-01  SOX=2.525E+00  HC  =6.942E+00  CO =1.890E+01
GFL =1.685E-01  PFL  =1.458E-01  AMM=1.900E-02  HMET=3.042E-02  ALD=1.065E-08
OPG =4.904E+00  SFIDE=5.076E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     504.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.257E-02  CYAN =1.619E-02  O&G =1.837E-02  PHEN=2.516E-03  TSS =3.734E-01
SFIDE=1.945E-04  FLIDE=1.114E-01  TI  =0.0        ZN  =9.347E-04  NITR=7.356E-03
PB   =5.555E-05  MN   =0.0        COD =2.582E-02  AL  =1.344E-02  CU  =3.840E-05
TDS  =4.469E-01  BOD  =1.713E-02  HMET=1.077E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.42 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.726E+06  PET=4.577E+06  GAS=1.465E+07  ELEC=1.376E+07  HELEC=1.421E+06
OTH =2.582E+05  TOT=4.441E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.045E+00  NOX =3.634E+01  SOX =1.039E+00  HC=2.800E-01  CO=4.123E+00
ALD =3.876E-01  OACD=1.009E-04  HMET=2.985E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   26137.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.035E-03  TSS=1.328E+00  SFIDE=1.691E-05  FLIDE=9.072E-04
TFE =1.071E-02  DFE=6.191E-03  ZN =1.016E-05  PB   =1.414E-05  MN   =3.082E-03
COD =2.027E+00  CU =0.0        TDS=7.540E+00  BOD  =1.211E+00  HMET =2.613E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.233E+00  NOX  =2.511E-01  SOX=2.670E+00  HC  =7.527E+00  CO =1.980E+01
GFL =1.211E-01  PFL  =1.034E-01  AMM=1.732E-02  HMET=2.966E-02  ALD=1.065E-08
ORG =5.556E+00  SFIDE=5.308E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     485.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.633E-02  CYAN =1.686E-02  O&G =1.990E-02  PHEN=2.633E-03  TSS =4.024E-01
SFIDE=2.129E-04  FLIDE=8.848E-02  TI  =0.0        ZN  =1.040E-03  NITR=8.202E-03
PB   =6.142E-05  MN   =0.0        COD =3.663E-02  AL  =2.162E-02  CU  =6.176E-05
TDS  =4.854E-01  BOD  =1.878E-02  HMET=1.126E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.43 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.511E+06  PET=4.101E+06  GAS=1.842E+07  ELEC=2.103E+07  HELEC=1.275E+06
OTH =1.168E+06  TOT=5.462E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.064E+00  NOX =2.744E+01  SOX =8.756E-01  HC=2.045E-01  CO=3.270E+00
ALD =3.364E-01  OACD=5.475E-05  HMET=2.867E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19898.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.399E-04   TSS=1.092E+00  SFIDE=1.795E-05  FLIDE=4.221E-04
TFE =7.002E-03  DFE=2.599E-03   ZN =9.116E-06  PB   =1.318E-05  MN   =2.327E-03
COD =1.760E+00  CU =0.0         TDS=3.694E+00  BOD  =1.051E+00  HMET =3.795E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.785E+00  NOX  =1.952E-01  SOX=2.182E+00  HC  =7.398E+00  CO =1.500E+01
GFL =1.431E-01  PFL  =1.243E-01  AMM=1.077E-02  HMET=3.014E-02  ALD=1.065E-03
ORG =5.867E+00  SFIDE=4.969E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      422.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.862E-03  CYAN =1.037E-03  O&G =7.995E-03  PHEN=1.852E-04  TSS =4.611E-02
SFIDE=1.927E-04  FLIDE=1.579E-02  TI  =0.0        ZN  =8.168E-04  NITR=6.420E-03
PB   =4.887E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.543E-01  BOD  =5.577E-03  HMET=1.055E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.44 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.693E+06  PET=4.896E+06  GAS=1.538E+07  ELEC=1.398E+07  HELEC=1.300E+06
OTH =2.696E+05  TOT=4.452E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.444E+00  NOX =2.973E+01  SOX =9.732E-01  HC=2.244E-01  CO=3.586E+00
ALD =3.763E-01  DACD=6.276E-05  HMET=2.256E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   21470.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.093E-04  TSS=1.216E+00  SFIDE=9.357E-06  FLIDE=4.722E-04
TFE =7.590E-03  DFE=2.796E-03  ZN =5.671E-06  PB   =7.638E-06  MN   =2.521E-03
COD =1.969E+00  CU =0.0        TDS=4.132E+00  BOD  =1.172E+00  HMET =3.301E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.235E+00  NOX  =2.157E-01  SOX=2.327E+00  HC  =8.064E+00  CO =1.627E+01
GFL =1.096E-01  PFL  =9.418E-02  AMM=1.203E-02  HMET=1.857E-02  ALD=1.065E-08
ORG =6.548E+00  SFIDE=4.321E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     412.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.267E-03  CYAN =1.115E-03  O&G =8.705E-03  PHEN=2.001E-04  TSS =4.600E-02
SFIDE=2.086E-04  FLIDE=1.581E-02  TI  =0.0        ZN  =8.857E-04  NITR=7.014E-03
PB   =5.200E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.478E-01  BOD  =6.086E-03  HMET=9.179E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.45 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.652E+06  PET=4.086E+06  GAS=1.246E+07  ELEC=1.190E+07  HELEC=9.746E+05
OTH =2.423E+05  TOT=3.618E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.705E+00  NOX =2.409E+01  SOX =8.294E-01  HC=1.740E-01  CO=2.976E+00
ALD =3.246E-01  DACD=3.267E-05  HMET=1.763E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    17383.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.735E-04  TSS=1.041E+00  SFIDE=6.352E-06  FLIDE=4.074E-04
TFE =6.148E-03  DFE=2.375E-03  ZN =3.926E-06  PB   =5.048E-06  MN   =2.043E-03
COD =1.699E+00  CU =0.0        TDS=3.565E+00  BOD  =1.011E+00  HMET =2.685E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.395E+00  NOX  =1.860E-01  SOX=1.925E+00  HC  =6.886E+00  CO =1.321E+01
GFI =1.018E-01  PFL  =8.787E-02  AMM=7.742E-03  HMET=1.280E-02  ALD=1.065E-08
ORG =5.646E+00  SFIDE=3.515E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      349.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.265E-03  CYAN =9.482E-04  O&G =7.177E-03  PHEN=1.652E-04  TSS =3.832E-02
SFIDE=1.696E-04  FLIDE=1.325E-02  TI  =0.0        ZN  =7.379E-04  NITR=5.854E-03
PB   =4.318E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.227E-01  BOD  =5.248E-03  HMET=7.468E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.46 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.280E+07  PET=4.212E+06  GAS=1.411E+07  ELEC=1.473E+07  HELEC=1.578E+06
OTH =2.643E+05  TOT=4.771E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.688E+00  NOX =4.306E+01  SOX =1.117E+00  HC=3.437E-01  CO=4.688E+00
ALD =4.044E-01  DACD=1.521E-04  HMET=3.796E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31070.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.296E-03  TSS=1.418E+00  SFIDE=1.692E-05  FLIDE=9.458E-04
TFE =1.270E-02  DFE=7.343E-03  ZN =1.338E-05  PB   =1.825E-05  MN   =3.650E-03
COD =2.113E+00  CU =0.0        TDS=6.498E+00  BOD  =1.265E+00  HMET =1.894E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.014E+00  NOX  =2.311E-01  SOX=2.789E+00  HC  =5.595E+00  CO =2.330E+01
GFL =1.292E-01  PFL  =1.104E-01  AMM=2.414E-02  HMET=3.833E-02  ALD=1.065E-08
ORG =5.607E+00  SFIDE=6.647E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      548.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.143E-01  CYAN =1.998E-02  O&G =2.082E-02  PHEN=3.091E-03  TSS =3.299E-01
SFIDE=2.372E-04  FLIDE=8.995E-02  TI  =0.0        ZN  =1.144E-03  NITR=8.995E-03
PB   =6.857E-05  MN   =0.0        COD =2.336E-02  AL  =1.018E-02  CU  =2.908E-05
TDS  =3.390E-01  BOD  =1.211E-02  HMET=1.408E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.47 Small Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.164E+07  PET=4.946E+06  GAS=1.698E+07  ELEC=1.564E+07  HELEC=2.045E+06
OTH =2.445E+05  TOT=5.150E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.242E+00  NOX =3.856E+01  SOX =1.060E+00  HC=3.065E-01  CO=4.300E+00
ALD =3.906E-01  DACD=1.288E-04  HMET=3.198E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    27761.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.177E-03  TSS=1.351E+00  SFIDE=1.895E-05  FLIDE=9.139E-04
TFE =1.137E-02  DFE=6.572E-03  ZN =1.136E-05  PB   =1.583E-05  MN   =3.268E-03
COD =2.042E+00  CU =0.0        TDS=7.614E+00  BOD  =1.221E+00  HMET =2.661E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.901E+00  NOX  =2.534E-01  SOX=2.793E+00  HC  =7.698E+00  CO =2.089E+01
GFI =1.842E-01  PFL  =1.593E-01  AMM=2.077E-02  HMET=3.300E-02  ALD=1.065E-08
ORG =5.451E+00  SFIDE=5.574E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      555.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.023E-01  CYAN =1.788E-02  O&G =2.035E-02  PHEN=2.782E-03  TSS =4.099E-01
SFIDE=2.159E-04  FLIDE=1.219E-01  TI  =0.0        ZN  =1.036E-03  NITR=8.154E-03
PB   =6.152E-05  MN   =0.0        COD =2.840E-02  AL  =1.469E-02  CU  =4.197E-05
TDS  =4.948E-01  BOD  =1.901E-02  HMET=1.182E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.48 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.264E+07  PET=5.997E+06  GAS=1.903E+07  ELEC=1.775E+07  HELEC=1.792E+06
OTH =3.335E+05  TOT=5.756E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.602E+00  NOX =4.730E+01  SOX =1.367E+00  HC=3.621E-01  CO=5.391E+00
ALD =5.115E-01  OACD=1.258E-04  HMET=3.776E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34006.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.884E-03  TSS=1.749E+00  SFIDE=2.047E-05  FLIDE=1.197E-03
TFE =1.393E-02  DFE=8.057E-03  ZN =1.254E-05  PB   =1.731E-05  MN   =4.011E-03
COD =2.675E+00  CU =0.0        TDS=9.935E+00  BOD  =1.598E+00  HMET =3.421E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.306E+00  NOX  =3.309E-01  SOX=3.482E+00  HC  =9.875E+00  CO =2.579E+01
GFL =1.530E-01  PFL  =1.304E-01  AMM=2.193E-02  HMET=3.655E-02  ALD=1.065E-08
ORG =7.313E+00  SFIDE=6.787E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      628.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.254E-01  CYAN =2.194E-02  O&G =2.601E-02  PHEN=3.431E-03  TSS =5.138E-01
SFIDE=2.797E-04  FLIDE=1.123E-01  TI  =0.0        ZN  =1.360E-03  NITR=1.074E-02
PB   =8.020E-05  MN   =0.0        COD =4.684E-02  AL  =2.727E-02  CU  =7.792E-05
TDS  =6.345E-01  BOD  =2.469E-02  HMET=1.440E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.49 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.102E+07  PET=5.348E+06  GAS=2.345E+07  ELEC=2.647E+07  HELEC=1.615E+06
OTH =1.429E+06  TOT=6.949E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.302E+00  NOX =3.565E+01  SOX =1.147E+00  HC=2.650E-01  CO=4.265E+00
ALD =4.416E-01  DACD=6.907E-05  HMET=3.597E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25841.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.164E-04  TSS=1.431E+00  SFIDE=2.168E-05  FLIDE=5.541E-04
TFE =9.098E-03  DFE=3.390E-03  ZN =1.119E-05  PB   =1.607E-05  MN   =3.024E-03
COD =2.311E+00  CU =0.0        TDS=4.849E+00  BOD  =1.379E+00  HMET =4.814E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.704E+00  NOX  =2.558E-01  SOX=2.835E+00  HC  =9.665E+00  CO =1.949E+01
GFL =1.814E-01  PFL  =1.574E-01  AMM=1.376E-02  HMET=3.694E-02  ALD=1.065E-08
ORG =7.699E+00  SFIDE=6.303E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      545.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.316E-03  CYAN =1.352E-03  O&G =1.040E-02  PHEN=2.410E-04  TSS =5.946E-02
SFIDE=2.504E-04  FLIDE=2.039E-02  TI  =0.0        ZN  =1.063E-03  NITR=8.364E-03
PB   =6.346E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.981E-01  BOD  =7.294E-03  HMET=1.338E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.50 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.149E+07  PET=6.528E+06  GAS=2.035E+07  ELEC=1.838E+07  HELEC=1.679E+06
OTH =3.538E+05  TOT=5.880E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.910E+00  NOX =3.932E+01  SOX =1.301E+00  HC=2.948E-01  CO=4.766E+00
ALD =5.045E-01  DACD=7.827E-05  HMET=2.880E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    28381.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.353E-04  TSS=1.627E+00  SFIDE=1.092E-05  FLIDE=6.330E-04
TFE =1.004E-02  DFE=3.725E-03  ZN =6.929E-06  PB   =9.166E-06  MN   =3.333E-03
COD =2.640E+00  CU =0.0        TDS=5.539E+00  BOD  =1.571E+00  HMET =4.278E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.169E+00  NOX  =2.888E-01  SOX=3.084E+00  HC  =1.076E+01  CO =2.152E+01
GFL =1.417E-01  PFL  =1.217E-01  AMM=1.539E-02  HMET=2.262E-02  ALD=1.065E-08
ORG =8.776E+00  SFIDE=5.601E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      543.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.964E-03  CYAN =1.486E-03  O&G =1.154E-02  PHEN=2.654E-04  TSS =6.064E-02
SFIDE=2.760E-04  FLIDE=2.083E-02  TI  =0.0        ZN  =1.176E-03  NITR=9.320E-03
PB   =6.891E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.943E-01  BOD  =8.135E-03  HMET=1.190E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.51 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.909E+06  PET=5.486E+06  GAS=1.666E+07  ELEC=1.583E+07  HELEC=1.276E+06
OTH =3.238E+05  TOT=4.830E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.983E+00  NOX =3.234E+01  SOX =1.117E+00  HC=2.335E-01  CO=4.002E+00
ALD =4.377E-01  DACD=4.314E-05  HMET=2.314E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    23337.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=4.836E-04  TSS=1.403E+00  SFIDE=7.822E-06  FLIDE=5.493E-04
TFF =8.256E-03    DFE=3.193E-03  ZN =5.014E-06  PB   =6.360E-06  MN   =2.744E-03
COD =2.291E+00    CU =0.0        TDS=4.806E+00  BOD  =1.363E+00  HMET =3.554E-05
ARS =0.0          CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.162E+00  NOX  =2.506E-01  SOX=2.585E+00  HC  =9.263E+00  CO =1.774E+01
GFL =1.334E-01  PFL  =1.150E-01  AMM=1.031E-02  HMET=1.631E-02  ALD=1.065E-08
MRG =7.611E+00  SFIDE=4.653E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      466.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.726E-03  CYAN =1.275E-03  O&G =9.642E-03  PHEN=2.220E-04  TSS =5.123E-02
SFIDE=2.277E-04  FLIDE=1.769E-02  TI  =0.0        ZN  =9.913E-04  NITR=7.867E-03
PB   =5.795E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.637E-01  BOD  =7.062E-03  HMET=9.886E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.52 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.590E+07  PET=5.315E+06  GAS=1.683E+07  ELEC=1.731E+07  HELEC=1.587E+06
OTH =3.191E+05  TOT=5.728E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.165E+00  NOX =5.314E+01  SOX =1.440E+00  HC=4.141E-01  CO=5.890E+00
ALD =5.282E-01  OACD=1.635E-04  HMET=4.243E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   38289.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.289E-03  TSS=1.832E+00  SFIDE=1.503E-05  FLIDE=1.236E-03
TFE =1.567E-02  DFE=9.059E-03  ZN =1.332E-05  PB   =1.732E-05  MN   =4.507E-03
COD =2.761E+00  CU =0.0        TDS=8.448E+00  BOD  =1.650E+00  HMET =2.380E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.231E+00  NOX  =3.006E-01  SOX=3.453E+00  HC  =7.098E+00  CO =2.882E+01
GFL =1.312E-01  PFL  =1.111E-01  AMM=2.711E-02  HMET=3.772E-02  ALD=1.065E-08
ORG =7.327E+00  SFIDE=7.829E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      655.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.410E-01  CYAN =2.466E-02  O&G =2.617E-02  PHEN=3.831E-03  TSS =3.674E-01
SFIDE=3.040E-04  FLIDE=9.449E-02  TI  =0.0        ZN  =1.448E-03  NITR=1.143E-02
PB   =8.617E-05  MN   =0.0        COD =2.685E-02  AL  =1.024E-02  CU  =2.925E-05
TDS  =4.189E-01  BOD  =1.559E-02  HMET=1.659E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.53 Medium Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.345E+07  PET=6.010E+06  GAS=1.886E+07  ELEC=1.649E+07  HELEC=1.777E+06
OTH =2.734E+05  TOT=5.686E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.267E+00  NOX =4.393E+01  SOX =1.329E+00  HC=3.292E-01  CO=5.109E+00
ALD =5.035E-01  DACD=9.854E-05  HMET=2.852E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31534.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.339E-03  TSS=1.704E+00  SFIDE=1.016E-05  FLIDE=1.179E-03
TFE =1.294E-02  DFE=7.480E-03  ZN =7.959E-06  PB   =9.933E-06  MN   =3.727E-03
COD =2.633E+00  CU =0.0        TDS=9.692E+00  BOD  =1.570E+00  HMET =3.218E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.037E+00  NOX  =3.233E-01  SOX=3.245E+00  HC  =9.446E+00  CO =2.393E+01
GFL =1.616E-01  PFL  =1.384E-01  AMM=1.833E-02  HMET=2.249E-02  ALD=1.065E-08
ORG =7.006E+00  SFIDE=5.501E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      597.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.164E-01  CYAN =2.038E-02  O&G =2.429E-02  PHEN=3.202E-03  TSS =4.008E-01
SFIDE=2.683E-04  FLIDE=1.108E-01  TI  =0.0        ZN  =1.255E-03  NITR=9.944E-03
PB   =7.347E-05  MN   =0.0        COD =2.920E-02  AL  =1.276E-02  CU  =3.645E-05
TDS  =5.911E-01  BOD  =2.382E-02  HMET=1.168E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.54 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.511E+07  PET=7.218E+06  GAS=2.274E+07  ELEC=2.110E+07  HELEC=2.090E+06
OTH =3.968E+05  TOT=6.868E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.939E+00  NOX =5.663E+01  SOX =1.652E+00  HC=4.313E-01  CO=6.480E+00
ALD =6.194E-01  DACD=1.452E-04  HMET=4.411E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   40702.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.468E-03  TSS=2.114E+00  SFIDE=2.299E-05  FLIDE=1.450E-03
TFE =1.668E-02  DFE=9.646E-03  ZN =1.435E-05  PB   =1.964E-05  MN  =4.803E-03
COD =3.239E+00  CU =0.0        TDS=1.201E+01  BOD  =1.935E+00  HMET =4.116E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.104E+01  NOX  =4.002E-01  SOX=4.175E+00  HC  =1.190E+01  CO =3.089E+01
GFL =1.786E-01  PFL  =1.520E-01  AMM=2.564E-02  HMET=4.173E-02  ALD=1.065E-08
ORG =8.837E+00  SFIDE=8.006E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      749.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.501E-01  CYAN =2.627E-02  O&G =3.126E-02  PHEN=4.111E-03  TSS =6.053E-01
SFIDE=3.374E-04  FLIDE=1.316E-01  TI  =0.0        ZN  =1.635E-03  NITR=1.292E-02
PB   =9.628E-05  MN   =0.0        COD =5.525E-02  AL  =3.180E-02  CU  =9.086E-05
TDS  =7.624E-01  BOD  =2.981E-02  HMET=1.699E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.55 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.328E+07  PET=6.484E+06  GAS=2.785E+07  ELEC=3.112E+07  HELEC=1.909E+06
OTH =1.637E+06  TOT=8.247E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.430E+00  NOX =4.309E+01  SOX =1.396E+00  HC=3.196E-01  CO=5.172E+00
ALD =5.385E-01  DACD=8.137E-05  HMET=4.216E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31224.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.062E-03  TSS=1.743E+00  SFIDE=2.452E-05  FLIDE=6.756E-04
TFE =1.100E-02  DFE=4.110E-03  ZN =1.285E-05  PB   =1.833E-05  MN   =3.655E-03
COD =2.817E+00  CU =0.0        TDS=5.912E+00  BOD  =1.680E+00  HMET =5.699E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.041E+01  NOX  =3.114E-01  SOX=3.428E+00  HC  =1.174E+01  CO =2.357E+01
GFL =2.146E-01  PFL  =1.861E-01  AMM=1.640E-02  HMET=4.236E-02  ALD=1.065E-08
ORG =9.385E+00  SFIDE=7.461E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      654.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.635E-03  CYAN =1.640E-03  O&G =1.259E-02  PHEN=2.917E-04  TSS =7.142E-02
SFIDE=3.027E-04  FLIDE=2.452E-02  TI  =0.0        ZN  =1.287E-03  NITR=1.013E-02
PB   =7.668E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.370E-01  BOD  =8.866E-03  HMET=1.584E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.56 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.349E+07  PET=7.679E+06  GAS=2.389E+07  ELEC=2.155E+07  HELEC=1.958E+06
OTH =4.144E+05  TOT=6.900E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.948E+00  NOX =4.615E+01  SOX =1.532E+00  HC=3.454E-01  CO=5.602E+00
ALD =5.944E-01  DACD=9.032E-05  HMET=3.346E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33309.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.331E-04  TSS=1.916E+00  SFIDE=1.235E-05  FLIDE=7.458E-04
TFE =1.178E-02  DFE=4.382E-03  ZN =7.947E-06  PB   =1.045E-05  MN   =3.913E-03
COD =3.110E+00  CU =0.0        TDS=6.526E+00  BOD  =1.851E+00  HMET =4.994E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.564E+00  NOX  =3.401E-01  SOX=3.622E+00  HC  =1.266E+01  CO =2.526E+01
GFL =1.653E-01  PFL  =1.419E-01  AMM=1.789E-02  HMET=2.592E-02  ALD=1.065E-08
ORG =1.034E+01  SFIDE=6.538E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      636.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.174E-03  CYAN =1.748E-03  O&G =1.356E-02  PHEN=3.117E-04  TSS =7.111E-02
SFIDE=3.240E-04  FLIDE=2.442E-02  TI  =0.0        ZN  =1.382E-03  NITR=1.095E-02
PB   =8.094E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.277E-01  BOD  =9.577E-03  HMET=1.389E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.57 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.160E+07  PET=7.168E+06  GAS=2.164E+07  ELEC=2.042E+07  HELEC=1.612E+06
OTH =4.205E+05  TOT=6.264E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.525E+00  NOX =4.226E+01  SOX =1.466E+00  HC=3.047E-01  CO=5.240E+00
ALD =5.749E-01  DACD=5.514E-05  HMET=2.934E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30485.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.017E-04  TSS=1.842E+00  SFIDE=9.030E-06  FLIDE=7.215E-04
TFE =1.079E-02  DFE=4.180E-03  ZN =6.118E-06  PB   =7.607E-06  MN   =3.585E-03
COD =3.009E+00  CU =0.0        TDS=6.313E+00  BOD  =1.790E+00  HMET =4.557E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.220E+00  NOX  =3.287E-01  SOX=3.377E+00  HC  =1.213E+01  CO =2.318E+01
GFL =1.688E-01  PFL  =1.453E-01  AMM=1.334E-02  HMET=1.983E-02  ALD=1.065E-08
ORG =9.995E+00  SFIDE=5.966E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      603.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.482E-03  CYAN =1.669E-03  O&G =1.261E-02  PHEN=2.903E-04  TSS =6.655E-02
SFIDE=2.975E-04  FLIDE=2.296E-02  TI  =0.0        ZN  =1.296E-03  NITR=1.029E-02
PB   =7.568E-05  MN   =0.0        COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =2.122E-01  BOD  =9.253E-03  HMET=1.268E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.58 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.998E+07  PET=6.619E+06  GAS=2.163E+07  ELEC=2.244E+07  HELEC=2.253E+06
OTH =4.073E+05  TOT=7.334E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.932E+00  NOX =6.700E+01  SOX =1.773E+00  HC=5.291E-01  CO=7.353E+00
ALD =6.456E-01  OACD=2.230E-04  HMET=5.658E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   48315.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.678E-03  TSS=2.253E+00  SFIDE=2.304E-05  FLIDE=1.510E-03
TFF =1.976E-02  DFE=1.142E-02  ZN =1.903E-05  PB   =2.547E-05  MN   =5.681E-03
COD =3.374E+00  CU =0.0        TDS=1.035E+01  BOD  =2.018E+00  HMET =2.971E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.210E+01  NOX  =3.683E-01  SOX=4.346E+00  HC  =8.815E+00  CO =3.629E+01
GFL =1.851E-01  PFL  =1.577E-01  AMM=3.606E-02  HMET=5.426E-02  ALD=1.065E-08
ORG =8.954E+00  SFIDE=1.013E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     841.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.778E-01  CYAN =3.109E-02  O&G =3.266E-02  PHEN=4.819E-03  TSS =4.910E-01
SFIDE=3.755E-04  FLIDE=1.307E-01  TI  =0.0        ZN  =1.800E-03  NITR=1.418E-02
PB   =1.076E-04  MN   =0.0        COD =3.524E-02  AL  =1.453E-02  CU  =4.152E-05
TDS  =5.278E-01  BOD  =1.921E-02  HMET=2.147E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.59 Large Auto - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.744E+07  PET=7.589E+06  GAS=2.498E+07  ELEC=2.247E+07  HELEC=2.709E+06
OTH =3.608E+05  TOT=7.556E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.981E+00  NOX =5.739E+01  SOX =1.651E+00  HC=4.441E-01  CO=6.528E+00
ALD =6.168E-01  OACD=1.625E-04  HMET=4.280E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   41262.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.377E-03  TSS=2.111E+00  SFIDE=2.128E-05  FLIDE=1.444E-03
TFE =1.691E-02  DFE=9.777E-03  ZN =1.389E-05  PB   =1.865E-05  MN   =4.866E-03
COD =3.225E+00  CU =0.0        TDS=1.195E+01  BOD  =1.926E+00  HMET =4.074E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.258E+01  NOX  =3.981E-01  SOX=4.195E+00  HC  =1.187E+01  CO =3.117E+01
GFL =2.448E-01  PFL  =2.110E-01  AMM=2.768E-02  HMET=3.996E-02  ALD=1.065E-08
ORG =8.596E+00  SFIDE=7.782E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     805.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.521E-01  CYAN =2.662E-02  O&G =3.096E-02  PHEN=4.160E-03  TSS =5.700E-01
SFIDE=3.348E-04  FLIDE=1.645E-01  TI  =0.0        ZN  =1.587E-03  NITR=1.253E-02
PB   =9.362E-05  MN   =0.0        COD =4.036E-02  AL  =1.945E-02  CU  =5.558E-05
TDS  =7.531E-01  BOD  =2.961E-02  HMET=1.651E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.60 Van - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.682E+07  PET=7.916E+06  GAS=2.535E+07  ELEC=2.381E+07  HELEC=2.459E+06
OTH =4.466E+05  TOT=7.683E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.726E+00  NOX =6.285E+01  SOX =1.797E+00  HC=4.843E-01  CO=7.130E+00
ALD =6.702E-01  DACD=1.748E-04  HMET=5.168E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    45211.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.044E-02  TSS=2.297E+00  SFIDE=2.931E-05  FLIDE=1.569E-03
TFF =1.852E-02  DFE=1.071E-02  ZN =1.760E-05  PB   =2.450E-05  MN   =5.330E-03
COD =3.504E+00  CU =0.0        TDS=1.304E+01  BOD  =2.094E+00  HMET =4.519E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.252E+01  NOX  =4.341E-01  SOX=4.618E+00  HC  =1.302E+01  CO =3.425E+01
GFL =2.096E-01  PFL  =1.789E-01  AMM=2.998E-02  HMET=5.139E-02  ALD=1.065E-08
ORG =9.607E+00  SFIDE=9.186E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      840.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.666E-01  CYAN =2.916E-02  O&G =3.441E-02  PHEN=4.554E-03  TSS =6.963E-01
SFIDE=3.682E-04  FLIDE=1.531E-01  TI  =0.0        ZN  =1.799E-03  NITR=1.419E-02
PB   =1.062E-04  MN   =0.0        COD =6.340E-02  AL  =3.742E-02  CU  =1.069E-04
TDS  =8.394E-01  BOD  =3.247E-02  HMET=1.949E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.61 Van - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.578E+07  PET=7.748E+06  GAS=3.265E+07  ELEC=3.615E+07  HELEC=2.229E+06
OTH =1.853E+06  TOT=9.664E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.684E+00  NOX =5.134E+01  SOX =1.674E+00  HC=3.801E-01  CO=6.180E+00
ALD =6.465E-01  DACD=9.469E-05  HMET=4.883E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37190.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.215E-03  TSS=2.091E+00  SFIDE=2.740E-05  FLIDE=8.112E-04
TFE =1.310E-02  DFE=4.911E-03  ZN =1.460E-05  PB   =2.067E-05  MN   =4.355E-03
COD =3.383E+00  CU =0.0        TDS=7.098E+00  BOD  =2.017E+00  HMET =6.661E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.227E+01  NOX  =3.734E-01  SOX=4.084E+00  HC  =1.404E+01  CO =2.808E+01
GFL =2.506E-01  PFL  =2.173E-01  AMM=1.929E-02  HMET=4.803E-02  ALD=1.065E-08
ORG =1.126E+01  SFIDE=8.721E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      774.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.096E-03  CYAN =1.959E-03  O&G =1.502E-02  PHEN=3.479E-04  TSS =8.461E-02
SFIDE=3.608E-04  FLIDE=2.908E-02  TI  =0.0        ZN  =1.535E-03  NITR=1.210E-02
PB   =9.132E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.798E-01  BOD  =1.062E-02  HMET=1.851E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.62 Van - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.551E+07  PET=8.651E+06  GAS=2.740E+07  ELEC=2.508E+07  HELEC=2.378E+06
OTH =4.849E+05  TOT=7.952E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.875E+00  NOX =5.304E+01  SOX =1.714E+00  HC=4.031E-01  CO=6.359E+00
ALD =6.609E-01  DACD=1.192E-04  HMET=4.182E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38316.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.670E-04  TSS=2.140E+00  SFIDE=1.890E-05  FLIDE=8.292E-04
TFE =1.354E-02  DFE=4.943E-03  ZN =1.099E-05  PB   =1.505E-05  MN   =4.496E-03
COD =3.458E+00  CU =0.0        TDS=7.256E+00  BOD  =2.059E+00  HMET =6.019E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.124E+01  NOX  =3.794E-01  SOX=4.140E+00  HC  =1.424E+01  CO =2.901E+01
GFL =2.004E-01  PFL  =1.724E-01  AMM=2.227E-02  HMET=3.609E-02  ALD=1.065E-08
ORG =1.150E+01  SFIDE=7.881E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      740.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.397E-03  CYAN =1.971E-03  O&G =1.548E-02  PHEN=3.556E-04  TSS =8.233E-02
SFIDE=3.720E-04  FLIDE=2.832E-02  TI  =0.0        ZN  =1.573E-03  NITR=1.245E-02
PB   =9.253E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.655E-01  BOD  =1.072E-02  HMET=1.674E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.63 Van - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.354E+07  PET=8.226E+06  GAS=2.560E+07  ELEC=2.504E+07  HELEC=2.191E+06
OTH =4.982E+05  TOT=7.477E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.398E+00  NOX =4.846E+01  SOX =1.643E+00  HC=3.518E-01  CO=5.943E+00
ALD =6.407E-01  DACD=7.087E-05  HMET=3.919E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    35011.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.774E-04  TSS=2.060E+00  SFIDE=1.774E-05  FLIDE=8.040E-04
TFF =1.237E-02  DFE=4.748E-03  ZN =9.706E-06  PB   =1.309E-05  MN   =4.111E-03
COD =3.353E+00  CU =0.0        TDS=7.035E+00  BOD  =1.997E+00  HMET =5.763E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.143E+01  NOX  =3.686E-01  SOX=3.876E+00  HC  =1.373E+01  CO =2.658E+01
GFL =2.283E-01  PFL  =1.975E-01  AMM=1.615E-02  HMET=3.192E-02  ALD=1.065E-08
ORG =1.115E+01  SFIDE=7.545E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      726.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.583E-03  CYAN =1.895E-03  O&G =1.441E-02  PHEN=3.316E-04  TSS =7.868E-02
SFIDE=3.410E-04  FLIDE=2.731E-02  TI  =0.0        ZN  =1.482E-03  NITR=1.173E-02
PB   =8.708E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.539E-01  BOD  =1.045E-02  HMET=1.602E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.64 Van - Otto Stratified Charged Engine, Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.919E+07  PET=6.485E+06  GAS=1.973E+07  ELEC=2.008E+07  HELEC=1.604E+06
OTH =3.775E+05  TOT=6.748E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.732E+00  NOX =6.385E+01  SOX =1.781E+00  HC=4.890E-01  CO=7.165E+00
ALD =6.593E-01  DACD=1.760E-04  HMET=4.726E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   45962.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.345E-03  TSS=2.271E+00  SFIDE=1.314E-05  FLIDE=1.543E-03
TFE =1.882E-02  DFE=1.088E-02  ZN =1.331E-05  PB   =1.643E-05  MN   =5.417E-03
COD =3.447E+00  CU =0.0        TDS=1.051E+01  BOD  =2.058E+00  HMET =2.897E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.054E+01  NOX  =3.742E-01  SOX=4.158E+00  HC  =8.692E+00  CO =3.468E+01
GFL =1.338E-01  PFI  =1.123E-01  AMM=3.032E-02  HMET=3.726E-02  ALD=1.065E-08
ORG =9.147E+00  SFIDE=9.093E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      769.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.693E-01  CYAN =2.963E-02  O&G =3.184E-02  PHEN=4.617E-03  TSS =4.080E-01
SFIDE=3.748E-04  FLIDE=9.965E-02  TI  =0.0        ZN  =1.771E-03  NITR=1.401E-02
PB   =1.048E-04  MN   =0.0        COD =3.060E-02  AL  =1.034E-02  CU  =2.956E-05
TDS  =5.037E-01  BOD  =1.928E-02  HMET=1.927E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.65 Van - Otto Stratified Charged Engine, Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.706E+07  PET=7.639E+06  GAS=2.389E+07  ELEC=2.085E+07  HELEC=2.227E+06
OTH =3.464E+05  TOT=7.202E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.961E+00  NOX =5.570E+01  SOX =1.694E+00  HC=4.165E-01  CO=6.489E+00
ALD =6.413E-01  DACD=1.227E-04  HMET=3.579E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39984.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.321E-03  TSS=2.169E+00  SFIDE=1.235E-05  FLIDE=1.501E-03
TFE =1.640E-02  DFE=9.485E-03  ZN =9.857E-06  PB   =1.221E-05  MN   =4.726E-03
COD =3.354E+00  CU =0.0        TDS=1.234E+01  BOD  =2.000E+00  HMET =4.089E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.141E+01  NOX  =4.116E-01  SOX=4.118E+00  HC  =1.201E+01  CO =3.035E+01
GFL =2.026E-01  PFL  =1.734E-01  AMM=2.299E-02  HMET=2.780E-02  ALD=1.065E-08
ORG =8.922E+00  SFIDE=6.936E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      756.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.475E-01  CYAN =2.584E-02  O&G =3.086E-02  PHEN=4.062E-03  TSS =5.052E-01
SFIDE=3.412E-04  FLIDE=1.392E-01  TI  =0.0        ZN  =1.594E-03  NITR=1.264E-02
PB   =9.333E-05  MN   =0.0        COD =3.688E-02  AL  =1.599E-02  CU  =4.569E-05
TDS  =7.509E-01  BOD  =3.031E-02  HMET=1.473E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.66 Mini-Auto, Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.031E+06  PET=3.902E+06  GAS=1.207E+07  ELEC=1.102E+07  HELEC=1.035E+06
OTH =2.080E+05  TOT=3.628E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.280E+00  NOX =3.018E+01  SOX =9.006E-01  HC=2.267E-01  CO=3.489E+00
ALD =3.399E-01  OACD=6.969E-05  HMET=2.198E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    21677.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.086E-03  TSS=1.154E+00  SFIDE=1.012E-05  FLIDE=7.958E-04
TFE =8.889E-03  DFE=5.140E-03  ZN =6.702E-06  PB   =8.943E-06  MN   =2.561E-03
COD =1.778E+00  CU =0.0        TDS=6.572E+00  BOD  =1.061E+00  HMET =2.221E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.732E+00  NOX  =2.190E-01  SOX=2.234E+00  HC  =6.453E+00  CO =1.648E+01
GFL =8.878E-02  PFL  =7.530E-02  AMM=1.282E-02  HMET=1.939E-02  ALD=1.065E-08
OPG =4.824E+00  SFIDE=4.099E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      394.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.996E-02  CYAN =1.400E-02  O&G =1.682E-02  PHEN=2.197E-03  TSS =3.089E-01
SFIDE=1.834E-04  FLIDE=6.620E-02  TI  =0.0        ZN  =8.809E-04  NITR=6.970E-03
PB   =5.169E-05  MN   =0.0        COD =2.828E-02  AL  =1.575E-02  CU  =4.500E-05
TDS  =4.102E-01  BOD  =1.624E-02  HMET=8.699E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.67 Mini-Auto, Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=6.741E+06  PET=3.408E+06  GAS=1.294E+07  ELEC=1.353E+07  HELEC=8.615E+05
OTH =5.801E+05  TOT=3.816E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.383E+00  NOX =2.226E+01  SOX =7.492E-01  HC=1.630E-01  CO=2.720E+00
ALD =2.917E-01  DACD=3.584E-05  HMET=1.793E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    16091.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.133E-04  TSS=9.386E-01  SFIDE=7.717E-06  FLIDE=3.660E-04
TFE =5.681E-03  DFE=2.160E-03  ZN =4.671E-06  PB   =6.272E-06  MN   =1.888E-03
COD =1.526E+00  CU =0.0        TDS=3.203E+00  BOD  =9.088E-01  HMET =2.591E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.037E+00  NOX  =1.673E-01  SOX=1.771E+00  HC  =6.222E+00  CO =1.218E+01
GFL =9.717E-02  PFL  =8.397E-02  AMM=7.780E-03  HMET=1.519E-02  ALD=1.065E-08
ORG =5.075E+00  SFIDE=3.392E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      324.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.942E-03  CYAN =8.623E-04  O&G =6.555E-03  PHEN=1.517E-04  TSS =3.556E-02
SFIDE=1.565E-04  FLIDE=1.229E-02  TI  =0.0        ZN  =6.701E-04  NITR=5.302E-03
PB   =3.950E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.152E-01  BOD  =4.723E-03  HMET=7.205E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.68 Mini-Auto, Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=7.449E+06  PET=4.282E+06  GAS=1.321E+07  ELEC=1.182E+07  HELEC=1.051E+06
OTH =2.268E+05  TOT=3.805E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.863E+00  NOX =2.548E+01  SOX =8.569E-01  HC=1.893E-01  CO=3.113E+00
ALD =3.335E-01  DACD=4.622E-05  HMET=1.768E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    18386.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.753E-04  TSS=1.073E+00  SFIDE=5.700E-06  FLIDE=4.185E-04
TFE =6.505E-03  DFE=2.442E-03  ZN =3.948E-06  PB   =5.050E-06  MN   =2.161E-03
COD =1.745E+00  CU =0.0        TDS=3.662E+00  BOD  =1.038E+00  HMET =2.691E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.223E+00  NOX  =1.905E-01  SOX=2.006E+00  HC  =7.067E+00  CO =1.396E+01
GFL =8.878E-02  PFL  =7.615E-02  AMM=9.476E-03  HMET=1.281E-02  ALD=1.065E-08
ORG =5.799E+00  SFIDE=3.523E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      349.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.513E-03  CYAN =9.743E-04  O&G =7.513E-03  PHEN=1.728E-04  TSS =3.912E-02
SFIDE=1.790E-04  FLIDE=1.343E-02  TI  =0.0        ZN  =7.666E-04  NITR=6.083E-03
PB   =4.482E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.248E-01  BOD  =5.356E-03  HMET=7.486E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.69 Mini-Auto, Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.683E+06  PET=3.539E+06  GAS=1.053E+07  ELEC=9.750E+06  HELEC=7.259E+05
OTH =2.044E+05  TOT=3.034E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.240E+00  NOX =2.087E+01  SOX =7.322E-01  HC=1.500E-01  CO=2.602E+00
ALD =2.878E-01  OACD=2.567E-05  HMET=1.336E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   15047.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.586E-04  TSS=9.204E-01  SFIDE=2.940E-06  FLIDE=3.612E-04
TFE =5.328E-03  DFE=2.074E-03  ZN =2.469E-06  PB   =2.860E-06  MN   =1.771E-03
COD =1.506E+00  CU =0.0        TDS=3.161E+00  BOD  =8.955E-01  HMET =2.140E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.377E+00  NOX  =1.641E-01  SOX=1.667E+00  HC  =6.030E+00  CO =1.145E+01
GFL =7.621E-02  PFL  =6.544E-02  AMM=6.414E-03  HMET=7.904E-03  ALD=1.065E-08
ORG =5.001E+00  SFIDE=2.802E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      291.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.695E-03  CYAN =8.283E-04  O&G =6.238E-03  PHEN=1.436E-04  TSS =3.239E-02
SFIDE=1.470E-04  FLIDE=1.114E-02  TI  =0.0        ZN  =6.411E-04  NITR=5.097E-03
PB   =3.732E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.026E-01  BOD  =4.604E-03  HMET=5.956E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.70 Mini-Auto, Otto Turbo Charged Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.077E+07  PET=3.591E+06  GAS=1.146E+07  ELEC=1.182E+07  HELEC=1.111E+06
OTH =2.170E+05  TOT=3.898E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.842E+00  NOX =3.602E+01  SOX =9.698E-01  HC=2.816E-01  CO=3.982E+00
ALD =3.552E-01  OACD=1.131E-04  HMET=2.919E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   25957.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=3.586E-03  TSS=1.234E+00  SFIDE=1.075E-05  FLIDE=8.310E-04
TFE =1.062E-02  DFE=6.140E-03  ZN =9.337E-06  PB   =1.224E-05  MN   =3.055E-03
COD =1.856E+00  CU =0.0        TDS=5.684E+00  BOD  =1.110E+00  HMET =1.609E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.320E+00  NOX  =2.023E-01  SOX=2.339E+00  HC  =4.792E+00  CO =1.953E+01
GFL =9.164E-02  PFL  =7.773E-02  AMM=1.864E-02  HMET=2.650E-02  ALD=1.065E-08
OPG =4.927E+00  SFIDE=5.343E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      446.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.555E-02  CYAN =1.671E-02  O&G =1.769E-02  PHEN=2.595E-03  TSS =2.529E-01
SFIDE=2.050E-04  FLIDE=6.565E-02  TI  =0.0        ZN  =9.780E-04  NITR=7.716E-03
PB   =5.826E-05  MN   =0.0        COD =1.839E-02  AL  =7.164E-03  CU  =2.047E-05
TDS  =2.839E-01  BOD  =1.051E-02  HMET=1.132E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.71 Mini-Auto, Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=9.547E+06  PET=4.172E+06  GAS=1.363E+07  ELEC=1.221E+07  HELEC=1.449E+06
OTH =1.970E+05  TOT=4.121E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.381E+00  NOX =3.138E+01  SOX =9.100E-01  HC=2.417E-01  CO=3.582E+00
ALD =3.407E-01  DACD=8.604E-05  HMET=2.294E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22558.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.145E-03  TSS=1.164E+00  SFIDE=1.097E-05  FLIDE=7.974E-04
TFE =9.245E-03  DFE=5.346E-03  ZN =7.304E-06  PB   =9.726E-06  MN   =2.661E-03
COD =1.781E+00  CU =0.0        TDS=6.593E+00  BOD  =1.064E+00  HMET =2.239E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.814E+00  NOX  =2.197E-01  SOX=2.297E+00  HC  =6.529E+00  CO =1.705E+01
GFL =1.311E-01  PFL  =1.129E-01  AMM=1.483E-02  HMET=2.097E-02  ALD=1.065E-08
ORG =4.747E+00  SFIDE=4.206E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     438.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.317E-02  CYAN =1.456E-02  O&G =1.699E-02  PHEN=2.277E-03  TSS =3.078E-01
SFIDE=1.844E-04  FLIDE=8.830E-02  TI  =0.0        ZN  =8.720E-04  NITR=6.892E-03
PB   =5.139E-05  MN   =0.0        COD =2.189E-02  AL  =1.041E-02  CU  =2.973E-05
TDS  =4.134E-01  BOD  =1.632E-02  HMET=8.925E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.72 Small Auto - Otto Turbo Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.924E+06  PET=4.340E+06  GAS=1.341E+07  ELEC=1.224E+07  HELEC=1.146E+06
OTH =2.310E+05  TOT=4.030E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.760E+00  NOX =3.355E+01  SOX =1.002E+00  HC=2.518E-01  CO=3.880E+00
ALD =3.784E-01  OACD=7.699E-05  HMET=2.434E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   24094.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.656E-03  TSS=1.285E+00  SFIDE=1.112E-05  FLIDE=8.859E-04
TFE =9.881E-03  DFE=5.713E-03  ZN =7.392E-06  PB   =9.847E-06  MN   =2.846E-03
COD =1.979E+00  CU =0.0        TDS=7.315E+00  BOD  =1.181E+00  HMET =2.471E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.362E+00  NOX  =2.438E-01  SOX=2.484E+00  HC  =7.179E+00  CO =1.832E+01
GFL =9.829E-02  PFL  =8.335E-02  AMM=1.419E-02  HMET=2.138E-02  ALD=1.065E-08
ORG =5.369E+00  SFIDE=4.545E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      438.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.888E-02  CYAN =1.556E-02  O&G =1.870E-02  PHEN=2.442E-03  TSS =3.425E-01
SFIDE=2.041E-04  FLIDE=7.334E-02  TI  =0.0        ZN  =9.797E-04  NITR=7.752E-03
PB   =5.747E-05  MN   =0.0        COD =3.136E-02  AL  =1.743E-02  CU  =4.981E-05
TDS  =4.562E-01  BOD  =1.807E-02  HMET=9.647E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.73 Small Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.516E+06  PET=3.801E+06  GAS=1.442E+07  ELEC=1.506E+07  HELEC=9.595E+05
OTH =6.443E+05  TOT=4.251E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.773E+00  NOX =2.482E+01  SOX =8.357E-01  HC=1.818E-01  CO=3.034E+00
ALD =3.254E-01  DACD=3.990E-05  HMET=1.996E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   17943.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.595E-04  TSS=1.047E+00  SFIDE=8.557E-06  FLIDE=4.083E-04
TFE =6.335E-03  DFE=2.410E-03  ZN =5.190E-06  PB   =6.963E-06  MN   =2.105E-03
COD =1.703E+00  CU =0.0        TDS=3.573E+00  BOD  =1.014E+00  HMET =2.886E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.614E+00  NOX  =1.866E-01  SOX=1.975E+00  HC  =6.940E+00  CO =1.359E+01
GFL =1.082E-01  PFL  =9.351E-02  AMM=8.669E-03  HMET=1.687E-02  ALD=1.065E-08
ORG =5.662E+00  SFIDE=3.778E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      361.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.396E-03  CYAN =9.617E-04  O&G =7.310E-03  PHEN=1.692E-04  TSS =3.964E-02
SFIDE=1.745E-04  FLIDE=1.370E-02  TI  =0.0        ZN  =7.473E-04  NITR=5.913E-03
PB   =4.405E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.284E-01  BOD  =5.268E-03  HMET=8.025E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.74 Small Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990 - Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.289E+06  PET=4.769E+06  GAS=1.470E+07  ELEC=1.315E+07  HELEC=1.168E+06
OTH =2.523E+05  TOT=4.234E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.301E+00  NOX =2.836E+01  SOX =9.544E-01  HC=2.106E-01  CO=3.465E+00
ALD =3.715E-01  DACD=5.120E-05  HMET=1.962E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    20462.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.157E-04  TSS=1.195E+00  SFIDE=6.270E-06  FLIDE=4.662E-04
TFE =7.240E-03  DFE=2.719E-03  ZN =4.365E-06  PB   =5.572E-06  MN   =2.405E-03
COD =1.944E+00  CU =0.0        TDS=4.079E+00  BOD  =1.157E+00  HMET =2.991E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.809E+00  NOX  =2.122E-01  SOX=2.233E+00  HC  =7.870E+00  CO =1.553E+01
GFL =9.865E-02  PFL  =8.461E-02  AMM=1.052E-02  HMET=1.416E-02  ALD=1.065E-03
ORG =6.460E+00  SFIDE=3.915E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      389.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.023E-03  CYAN =1.085E-03  O&G =8.363E-03  PHEN=1.923E-04  TSS =4.353E-02
SFIDE=1.993E-04  FLIDE=1.494E-02  TI  =0.0        ZN  =8.534E-04  NITR=6.772E-03
PB   =4.988E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.389E-01  BOD  =5.966E-03  HMET=8.319E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.75 Small Auto - Otto Turbo Charged Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.333E+06  PET=3.945E+06  GAS=1.173E+07  ELEC=1.085E+07  HELEC=8.058E+05
OTH =2.277E+05  TOT=3.379E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.613E+00  NOX =2.327E+01  SOX =8.166E-01  HC=1.672E-01  CO=2.901E+00
ALD =3.210E-01  DACD=2.853E-05  HMET=1.483E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   16774.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.864E-04  TSS=1.027E+00  SFIDE=3.202E-06  FLIDE=4.029E-04
TFE =5.940E-03  DFE=2.313E-03  ZN =2.725E-06  PB   =3.144E-06  MN   =1.974E-03
COD =1.680E+00  CU =0.0        TDS=3.525E+00  BOD  =9.989E-01  HMET =2.381E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.871E+00  NOX  =1.830E-01  SOX=1.859E+00  HC  =6.724E+00  CO =1.277E+01
GFL =8.460E-02  PFL  =7.264E-02  AMM=7.141E-03  HMET=8.718E-03  ALD=1.065E-08
DRG =5.579E+00  SFIDE=3.117E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     324.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.119E-03  CYAN =9.236E-04  O&G =6.954E-03  PHEN=1.601E-04  TSS =3.608E-02
SFIDE=1.639E-04  FLIDE=1.241E-02  TI  =0.0        ZN  =7.147E-04  NITR=5.683E-03
PB   =4.160E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.143E-01  BOD  =5.134E-03  HMET=6.625E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.76 Small Auto = Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.196E+07  PET=3.989E+06  GAS=1.270E+07  ELEC=1.309E+07  HELEC=1.221E+06
OTH =2.406E+05  TOT=4.321E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.379E+00  NOX =3.997E+01  SOX =1.078E+00  HC=3.122E-01  CO=4.423E+00
ALD =3.952E-01  DACD=1.248E-04  HMET=3.225E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   28807.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.930E-03  TSS=1.372E+00  SFIDE=1.174E-05  FLIDE=9.246E-04
TFE =1.179E-02  DFE=6.315E-03  ZN =1.026E-05  PB   =1.342E-05  MN   =3.390E-03
COD =2.065E+00  CU =0.0        TDS=6.322E+00  BOD  =1.235E+00  HMET =1.787E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.993E+00  NOX  =2.250E-01  SOX=2.596E+00  HC  =5.325E+00  CO =2.167E+01
GFL =1.008E-01  PFL  =8.545E-02  AMM=2.059E-02  HMET=2.909E-02  ALD=1.065E-08
ORG =5.481E+00  SFIDE=5.918E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     494.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.060E-01  CYAN =1.855E-02  O&G =1.965E-02  PHEN=2.880E-03  TSS =2.794E-01
SFIDE=2.278E-04  FLIDE=7.232E-02  TI  =0.0        ZN  =1.087E-03  NITR=8.574E-03
PB   =6.470E-05  MN   =0.0        COD =2.035E-02  AL  =7.875E-03  CU  =2.250E-05
TDS  =3.150E-01  BOD  =1.168E-02  HMET=1.254E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.77 Small Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.060E+07  PET=4.640E+06  GAS=1.513E+07  ELEC=1.354E+07  HELEC=1.599E+06
OTH =2.187E+05  TOT=4.573E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.871E+00  NOX =3.485E+01  SOX =1.013E+00  HC=2.680E-01  CO=3.981E+00
ALD =3.794E-01  DACD=9.464E-05  HMET=2.533E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25049.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.719E-03  TSS=1.296E+00  SFIDE=1.197E-05  FLIDE=8.882E-04
TFE =1.027E-02  DFE=5.937E-03  ZN =8.017E-06  PB   =1.065E-05  MN   =2.955E-03
COD =1.984E+00  CU =0.0        TDS=7.341E+00  BOD  =1.185E+00  HMET =2.489E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.547E+00  NOX  =2.446E-01  SOX=2.553E+00  HC  =7.263E+00  CO =1.894E+01
GFL =1.447E-01  PFL  =1.245E-01  AMM=1.636E-02  HMET=2.300E-02  ALD=1.065E-08
ORG =5.286E+00  SFIDE=4.655E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      486.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.236E-02  CYAN =1.616E-02  O&G =1.889E-02  PHEN=2.529E-03  TSS =3.406E-01
SFIDE=2.052E-04  FLIDE=9.753E-02  TI  =0.0        ZN  =9.698E-04  NITR=7.666E-03
PB   =5.713E-05  MN   =0.0        COD =2.424E-02  AL  =1.148E-02  CU  =3.280E-05
TDS  =4.596E-01  BOD  =1.816E-02  HMET=9.878E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.78 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.168E+07  PET=5.713E+06  GAS=1.753E+07  ELEC=1.592E+07  HELEC=1.461E+06
OTH =3.008E+05  TOT=5.262E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.260E+00  NOX =4.395E+01  SOX =1.323E+00  HC=3.283E-01  CO=5.100E+00
ALD =5.006E-01  DACD=9.700E-05  HMET=3.112E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31554.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.430E-03  TSS=1.697E+00  SFIDE=1.349E-05  FLIDE=1.172E-03
TFE =1.294E-02  DFE=7.484E-03  ZN =9.210E-06  PB   =1.214E-05  MN   =3.729E-03
COD =2.618E+00  CU =0.0        TDS=9.667E+00  BOD  =1.563E+00  HMET =3.250E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.259E+00  NOX  =3.223E-01  SOX=3.259E+00  HC  =9.459E+00  CO =2.401E+01
GFL =1.255E-01  PFL  =1.063E-01  AMM=1.817E-02  HMET=2.657E-02  ALD=1.065E-08
ORG =7.090E+00  SFIDE=5.870E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      571.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.164E-01  CYAN =2.039E-02  O&G =2.458E-02  PHEN=3.202E-03  TSS =4.418E-01
SFIDE=2.691E-04  FLIDE=9.409E-02  TI  =0.0        ZN  =1.288E-03  NITR=1.020E-02
PB   =7.547E-05  MN   =0.0        COD =4.050E-02  AL  =2.224E-02  CU  =6.354E-05
TDS  =5.995E-01  BOD  =2.385E-02  HMET=1.246E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.79 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.824E+06  PET=4.988E+06  GAS=1.864E+07  ELEC=1.931E+07  HELEC=1.236E+06
OTH =8.003E+05  TOT=5.495E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.953E+00  NOX =3.251E+01  SOX =1.099E+00  HC=2.378E-01  CO=3.981E+00
ALD =4.284E-01  DACD=5.125E-05  HMET=2.551E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23497.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.797E-04  TSS=1.378E+00  SFIDE=1.039E-05  FLIDE=5.376E-04
TFE =8.298E-03  DFE=3.162E-03  ZN =6.474E-06  PB   =8.594E-06  MN   =2.758E-03
COD =2.242E+00  CU =0.0        TDS=4.704E+00  BOD  =1.335E+00  HMET =3.722E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.297E+00  NOX  =2.455E-01  SOX=2.587E+00  HC  =9.116E+00  CO =1.780E+01
GFL =1.395E-01  PFL  =1.205E-01  AMM=1.124E-02  HMET=2.100E-02  ALD=1.065E-08
ORG =7.453E+00  SFIDE=4.878E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      471.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.757E-03  CYAN =1.262E-03  O&G =9.582E-03  PHEN=2.218E-04  TSS =5.170E-02
SFIDE=2.286E-04  FLIDE=1.789E-02  TI  =0.0        ZN  =9.798E-04  NITR=7.756E-03
PB   =5.768E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.671E-01  BOD  =6.924E-03  HMET=1.035E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.80 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990 - Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.103E+07  PET=6.381E+06  GAS=1.957E+07  ELEC=1.744E+07  HELEC=1.527E+06
OTH =3.339E+05  TOT=5.629E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.746E+00  NOX =3.774E+01  SOX =1.279E+00  HC=2.789E-01  CO=4.627E+00
ALD =4.989E-01  DACD=6.493E-05  HMET=2.541E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27218.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.272E-04  TSS=1.603E+00  SFIDE=7.362E-06  FLIDE=6.261E-04
TFE =9.633E-03  DFE=3.637E-03  ZN =5.423E-06  PB   =6.782E-06  MN   =3.200E-03
COD =2.611E+00  CU =0.0        TDS=5.478E+00  BOD  =1.553E+00  HMET =3.921E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.678E+00  NOX  =2.848E-01  SOX=2.975E+00  HC  =1.054E+01  CO =2.067E+01
GFL =1.291E-01  PFL  =1.106E-01  AMM=1.364E-02  HMET=1.753E-02  ALD=1.065E-08
DRG =8.674E+00  SFIDE=5.133E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      515.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.682E-03  CYAN =1.451E-03  O&G =1.115E-02  PHEN=2.565E-04  TSS =5.780E-02
SFIDE=2.652E-04  FLIDE=1.982E-02  TI  =0.0        ZN  =1.139E-03  NITR=9.041E-03
PB   =6.647E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.839E-01  BOD  =7.996E-03  HMET=1.091E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.81 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.513E+06  PET=5.311E+06  GAS=1.576E+07  ELEC=1.453E+07  HELEC=1.067E+06
OTH =3.058E+05  TOT=4.534E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.868E+00  NOX =3.133E+01  SOX =1.101E+00  HC=2.250E-01  CO=3.909E+00
ALD =4.331E-01  DACD=3.803E-05  HMET=1.969E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    22580.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.761E-04  TSS=1.385E+00  SFIDE=3.937E-06  FLIDE=5.436E-04
TFE =7.997E-03  DFE=3.116E-03  ZN =3.532E-06  PB   =4.012E-06  MN   =2.658E-03
COD =2.267E+00  CU =0.0        TDS=4.757E+00  BOD  =1.348E+00  HMET =3.178E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.514E+00  NOX  =2.468E-01  SOX=2.502E+00  HC  =9.061E+00  CO =1.719E+01
GFL =1.121E-01  PFL  =9.624E-02  AMM=9.571E-03  HMET=1.127E-02  ALD=1.065E-03
DRG =7.526E+00  SFIDE=4.160E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      435.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.546E-03  CYAN =1.244E-03  O&G =9.365E-03  PHEN=2.157E-04  TSS =4.845E-02
SFIDE=2.206E-04  FLIDE=1.665E-02  TI  =0.0        ZN  =9.625E-04  NITR=7.655E-03
PB   =5.599E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.534E-01  BOD  =6.920E-03  HMET=8.844E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.82 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.518E+07  PET=5.125E+06  GAS=1.562E+07  ELEC=1.591E+07  HELEC=1.280E+06
OTH =2.987E+05  TOT=5.342E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.901E+00  NOX =5.050E+01  SOX =1.406E+00  HC=3.871E-01  CO=5.663E+00
ALD =5.205E-01  DACD=1.400E-04  HMET=3.752E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36351.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.018E-03  TSS=1.793E+00  SFIDE=1.057E-05  FLIDE=1.218E-03
TFE =1.488E-02  DFE=8.606E-03  ZN =1.063E-05  PB   =1.316E-05  MN   =4.284E-03
COD =2.721E+00  CU =0.0        TDS=8.300E+00  BOD  =1.625E+00  HMET =2.289E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.354E+00  NOX  =2.955E-01  SOX=3.288E+00  HC  =6.868E+00  CO =2.743E+01
GFL =1.047E-01  PFL  =8.957E-02  AMM=2.406E-02  HMET=2.977E-02  ALD=1.065E-08
ORG =7.221E+00  SFIDE=7.203E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      608.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.339E-01  CYAN =2.343E-02  O&G =2.517E-02  PHEN=3.651E-03  TSS =3.239E-01
SFIDE=2.960E-04  FLIDE=7.933E-02  TI  =0.0        ZN  =1.399E-03  NITR=1.107E-02
PB   =8.287E-05  MN   =0.0        COD =2.426E-02  AL  =8.254E-03  CU  =2.358E-05
TDS  =3.984E-01  BOD  =1.523E-02  HMET=1.526E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.83 Medium Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.293E+07  PET=5.856E+06  GAS=1.793E+07  ELEC=1.543E+07  HELEC=1.552E+06
OTH =2.604E+05  TOT=5.396E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.080E+00  NOX =4.206E+01  SOX =1.305E+00  HC=3.098E-01  CO=4.949E+00
ALD =4.979E-01  DACD=8.135E-05  HMET=2.517E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30170.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.109E-03  TSS=1.677E+00  SFIDE=6.650E-06  FLIDE=1.166E-03
TFE =1.238E-02  DFE=7.160E-03  ZN =6.277E-06  PB   =7.326E-06  MN   =3.569E-03
COD =2.605E+00  CU =0.0        TDS=9.555E+00  BOD  =1.552E+00  HMET =3.131E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.355E+00  NOX  =3.189E-01  SOX=3.124E+00  HC  =9.228E+00  CO =2.295E+01
GFL =1.417E-01  PFL  =1.209E-01  AMM=1.611E-02  HMET=1.746E-02  ALD=1.065E-08
DPG =6.924E+00  SFIDE=5.039E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      562.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.114E-01  CYAN =1.951E-02  O&G =2.356E-02  PHEN=3.075E-03  TSS =3.660E-01
SFIDE=2.629E-04  FLIDE=9.858E-02  TI  =0.0        ZN  =1.221E-03  NITR=9.699E-03
PB   =7.127E-05  MN   =0.0        COD =2.711E-02  AL  =1.114E-02  CU  =3.184E-05
TDS  =5.734E-01  BOD  =2.340E-02  HMET=1.070E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.84 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.404E+07  PET=6.900E+06  GAS=2.107E+07  ELEC=1.905E+07  HELEC=1.720E+06
OTH =3.602E+05  TOT=6.315E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.556E+00  NOX =5.288E+01  SOX =1.602E+00  HC=3.935E-01  CO=6.153E+00
ALD =6.071E-01  DACD=1.130E-04  HMET=3.670E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37956.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.958E-03  TSS=2.055E+00  SFIDE=1.520E-05  FLIDE=1.421E-03
TFF =1.557E-02  DFE=9.004E-03  ZN =1.063E-05  PB   =1.387E-05  MN   =4.487E-03
COD =3.175E+00  CU =0.0        TDS=1.171E+01  BOD  =1.894E+00  HMET =3.924E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.865E+00  NOX  =3.905E-01  SOX=3.925E+00  HC  =1.143E+01  CO =2.889E+01
GFL =1.479E-01  PFL  =1.252E-01  AMM=2.145E-02  HMET=3.060E-02  ALD=1.065E-08
ORG =8.586E+00  SFIDE=6.981E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      684.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.401E-01  CYAN =2.453E-02  O&G =2.965E-02  PHEN=3.855E-03  TSS =5.249E-01
SFIDE=3.255E-04  FLIDE=1.113E-01  TI  =0.0        ZN  =1.554E-03  NITR=1.231E-02
PB   =9.098E-05  MN   =0.0        COD =4.816E-02  AL  =2.618E-02  CU  =7.480E-05
TDS  =7.231E-01  BOD  =2.887E-02  HMET=1.482E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.85 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.194E+07  PET=6.081E+06  GAS=2.245E+07  ELEC=2.307E+07  HELEC=1.484E+06
OTH =9.291E+05  TOT=6.613E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.039E+00  NOX =3.957E+01  SOX =1.343E+00  HC=2.891E-01  CO=4.855E+00
ALD =5.238E-01  OACD=6.133E-05  HMET=3.040E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   28596.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.827E-04  TSS=1.683E+00  SFIDE=1.181E-05  FLIDE=6.573E-04
TFE =1.010E-02  DFE=3.856E-03  ZN =7.546E-06  PB   =9.918E-06  MN   =3.357E-03
COD =2.741E+00  CU =0.0        TDS=5.752E+00  BOD  =1.631E+00  HMET =4.471E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.825E+00  NOX  =3.000E-01  SOX=3.150E+00  HC  =1.112E+01  CO =2.167E+01
GFL =1.675E-01  PFL  =1.446E-01  AMM=1.357E-02  HMET=2.443E-02  ALD=1.065E-08
ORG =9.111E+00  SFIDE=5.854E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     572.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.008E-03  CYAN =1.539E-03  O&G =1.167E-02  PHEN=2.702E-04  TSS =6.270E-02
SFIDE=2.784E-04  FLIDE=2.171E-02  TI  =0.0        ZN  =1.194E-03  NITR=9.453E-03
PB   =7.020E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.021E-01  BOD  =8.452E-03  HMET=1.243E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.86 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.296E+07  PET=7.509E+06  GAS=2.300E+07  ELEC=2.047E+07  HELEC=1.786E+06
OTH =3.918E+05  TOT=6.613E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.758E+00  NOX =4.434E+01  SOX =1.506E+00  HC=3.274E-01  CO=5.442E+00
ALD =5.876E-01  DACD=7.534E-05  HMET=2.965E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   31979.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.118E-04  TSS=1.988E+00  SFIDE=8.360E-06  FLIDE=7.374E-04
TFE =1.132E-02  DFE=4.279E-03  ZN =6.257E-06  PB   =7.781E-06  MN   =3.760E-03
COD =3.075E+00  CU =0.0        TDS=6.452E+00  BOD  =1.829E+00  HMET =4.590E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.007E+00  NOX  =3.353E-01  SOX=3.498E+00  HC  =1.240E+01  CO =2.429E+01
GFL =1.510E-01  PFL  =1.294E-01  AMM=1.592E-02  HMET=2.021E-02  ALD=1.065E-08
ORG =1.022E+01  SFIDE=6.009E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     605.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.852E-03  CYAN =1.708E-03  O&G =1.311E-02  PHEN=3.015E-04  TSS =6.787E-02
SFIDE=3.116E-04  FLIDE=2.328E-02  TI  =0.0        ZN  =1.339E-03  NITR=1.063E-02
PB   =7.814E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.159E-01  BOD  =9.413E-03  HMET=1.277E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.87 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.112E+07  PET=6.949E+06  GAS=2.055E+07  ELEC=1.888E+07  HELEC=1.370E+06
OTH =3.988E+05  TOT=5.909E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.377E+00  NOX =4.099E+01  SOX =1.444E+00  HC=2.942E-01  CO=5.120E+00
ALD =5.681E-01  DACD=4.915E-05  HMET=2.532E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   29539.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.773E-04  TSS=1.816E+00  SFIDE=4.567E-06  FLIDE=7.131E-04
TFE =1.046E-02  DFE=4.080E-03  ZN =4.409E-06  PB   =4.904E-06  MN   =3.477E-03
COD =2.974E+00  CU =0.0        TDS=6.240E+00  BOD  =1.768E+00  HMET =4.115E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.456E+00  NOX  =3.236E-01  SOX=3.273E+00  HC  =1.187E+01  CO =2.249E+01
GFL =1.440E-01  PFL  =1.235E-01  AMM=1.245E-02  HMET=1.402E-02  ALD=1.065E-08
ORG =9.872E+00  SFIDE=5.388E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      566.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.256E-03  CYAN =1.630E-03  O&G =1.226E-02  PHEN=2.823E-04  TSS =6.321E-02
SFIDE=2.887E-04  FLIDE=2.171E-02  TI  =0.0        ZN  =1.260E-03  NITR=1.002E-02
PB   =7.323E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.998E-01  BOD  =9.067E-03  HMET=1.145E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.88 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.884E+07  PET=6.322E+06  GAS=1.974E+07  ELEC=2.023E+07  HELEC=1.772E+06
OTH =3.754E+05  TOT=6.730E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.520E+00  NOX =6.287E+01  SOX =1.721E+00  HC=4.869E-01  CO=6.999E+00
ALD =6.335E-01  DACD=1.863E-04  HMET=4.890E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    45283.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.254E-03  TSS=2.192E+00  SFIDE=1.606E-05  FLIDE=1.482E-03
TFE =1.853E-02  DFE=1.072E-02  ZN =1.482E-05  PB   =1.896E-05  MN   =5.332E-03
COD =3.311E+00  CU =0.0        TDS=1.012E+01  BOD  =1.979E+00  HMET =2.829E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.073E+01  NOX  =3.602E-01  SOX=4.088E+00  HC  =8.455E+00  CO =3.411E+01
GFL =1.469E-01  PFL  =1.240E-01  AMM=3.128E-02  HMET=4.181E-02  ALD=1.065E-08
ORG =8.788E+00  SFIDE=9.153E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      768.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.667E-01  CYAN =2.917E-02  O&G =3.109E-02  PHEN=4.537E-03  TSS =4.230E-01
SFIDE=3.630E-04  FLIDE=1.069E-01  TI  =0.0        ZN  =1.724E-03  NITR=1.362E-02
PB   =1.024E-04  MN   =0.0        COD =3.118E-02  AL  =1.143E-02  CU  =3.265E-05
TDS  =4.957E-01  BOD  =1.864E-02  HMET=1.939E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.89 Large Auto - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.631E+07  PET=7.254E+06  GAS=2.295E+07  ELEC=2.017E+07  HELEC=2.220E+06
OTH =3.325E+05  TOT=6.924E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.575E+00  NOX =5.333E+01  SOX =1.600E+00  HC=4.020E-01  CO=6.179E+00
ALD =6.047E-01  OACD=1.251E-04  HMET=3.552E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38297.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.876E-03  TSS=2.051E+00  SFIDE=1.363E-05  FLIDE=1.416E-03
TFE =1.571E-02  DFE=9.082E-03  ZN =1.023E-05  PB   =1.297E-05  MN   =4.524E-03
COD =3.163E+00  CU =0.0        TDS=1.165E+01  BOD  =1.887E+00  HMET =3.886E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.110E+01  NOX  =3.886E-01  SOX=3.932E+00  HC  =1.139E+01  CO =2.904E+01
GFL =2.014E-01  PFL  =1.729E-01  AMM=2.285E-02  HMET=2.901E-02  ALD=1.065E-08
ORG =8.417E+00  SFIDE=6.775E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      729.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.413E-01  CYAN =2.474E-02  O&G =2.937E-02  PHEN=3.884E-03  TSS =4.941E-01
SFIDE=3.232E-04  FLIDE=1.378E-01  TI  =0.0        ZN  =1.515E-03  NITR=1.200E-02
PB   =8.882E-05  MN   =0.0        COD =3.581E-02  AL  =1.594E-02  CU  =4.554E-05
TDS  =7.146E-01  BOD  =2.868E-02  HMET=1.438E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.90 Van - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.545E+07  PET=7.502E+06  GAS=2.321E+07  ELEC=2.121E+07  HELEC=1.995E+06
OTH =4.002E+05  TOT=6.978E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.230E+00  NOX =5.805E+01  SOX =1.731E+00  HC=4.362E-01  CO=6.708E+00
ALD =6.533E-01  DACD=1.344E-04  HMET=4.236E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   41694.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.781E-03  TSS=2.218E+00  SFIDE=1.957E-05  FLIDE=1.529E-03
TFE =1.710E-02  DFE=9.887E-03  ZN =1.294E-05  PB   =1.728E-05  MN   =4.925E-03
COD =3.416E+00  CU =0.0        TDS=1.263E+01  BOD  =2.039E+00  HMET =4.271E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.103E+01  NOX  =4.210E-01  SOX=4.297E+00  HC  =1.241E+01  CO =3.170E+01
GFL =1.711E-01  PFL  =1.451E-01  AMM=2.469E-02  HMET=3.744E-02  ALD=1.065E-03
ORG =9.272E+00  SFIDE=7.892E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      758.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.538E-01  CYAN =2.693E-02  O&G =3.234E-02  PHEN=4.225E-03  TSS =5.948E-01
SFIDE=3.526E-04  FLIDE=1.275E-01  TI  =0.0        ZN  =1.694E-03  NITR=1.340E-02
PB   =9.939E-05  MN   =0.0        COD =5.445E-02  AL  =3.036E-02  CU  =8.674E-05
TDS  =7.887E-01  BOD  =3.122E-02  HMET=1.675E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.91 Van - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.421E+07  PET=7.252E+06  GAS=2.657E+07  ELEC=2.718E+07  HELEC=1.753E+06
OTH =1.076E+06  TOT=7.826E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.203E+00  NOX =4.715E+01  SOX =1.603E+00  HC=3.442E-01  CO=5.789E+00
ALD =6.256E-01  DACD=7.234E-05  HMET=3.577E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34064.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.974E-04  TSS=2.010E+00  SFIDE=1.349E-05  FLIDE=7.851E-04
TFE =1.203E-02  DFE=4.598E-03  ZN =8.760E-06  PB   =1.144E-05  MN   =3.999E-03
COD =3.274E+00  CU =0.0        TDS=6.870E+00  BOD  =1.949E+00  HMET =5.285E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.047E+01  NOX  =3.581E-01  SOX=3.753E+00  HC  =1.327E+01  CO =2.582E+01
GFL =1.979E-01  PFL  =1.708E-01  AMM=1.608E-02  HMET=2.832E-02  ALD=1.065E-08
ORG =1.088E+01  SFIDE=6.920E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      679.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.349E-03  CYAN =1.835E-03  O&G =1.391E-02  PHEN=3.220E-04  TSS =7.455E-02
SFIDE=3.316E-04  FLIDE=2.582E-02  TI  =0.0        ZN  =1.423E-03  NITR=1.127E-02
PB   =8.362E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.400E-01  BOD  =1.009E-02  HMET=1.470E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.92 Van - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.469E+07  PET=8.386E+06  GAS=2.602E+07  ELEC=2.341E+07  HELEC=2.114E+06
OTH =4.500E+05  TOT=7.509E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.581E+00  NOX =5.025E+01  SOX =1.674E+00  HC=3.752E-01  CO=6.111E+00
ALD =6.503E-01  DACD=9.616E-05  HMET=3.596E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36262.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.806E-04  TSS=2.095E+00  SFIDE=1.278E-05  FLIDE=8.160E-04
TFE =1.283E-02  DFE=4.784E-03  ZN =8.390E-06  PB   =1.095E-05  MN   =4.260E-03
COD =3.403E+00  CU =0.0        TDS=7.140E+00  BOD  =2.025E+00  HMET =5.397E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.038E+01  NOX  =3.719E-01  SOX=3.947E+00  HC  =1.383E+01  CO =2.751E+01
GFL =1.785E-01  PFL  =1.532E-01  AMM=1.924E-02  HMET=2.732E-02  ALD=1.065E-08
ORG =1.131E+01  SFIDE=7.066E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      692.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.899E-03  CYAN =1.908E-03  O&G =1.478E-02  PHEN=3.398E-04  TSS =7.734E-02
SFIDE=3.528E-04  FLIDE=2.655E-02  TI  =0.0        ZN  =1.507E-03  NITR=1.195E-02
PB   =8.820E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.473E-01  BOD  =1.047E-02  HMET=1.501E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.95 Van - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.259E+07  PET=7.794E+06  GAS=2.344E+07  ELEC=2.201E+07  HELEC=1.712E+06
OTH =4.554E+05  TOT=6.776E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.106E+00  NOX =4.596E+01  SOX =1.599E+00  HC=3.311E-01  CO=5.707E+00
ALD =6.275E-01  DACD=5.904E-05  HMET=3.124E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33147.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.316E-04  TSS=2.009E+00  SFIDE=8.925E-06  FLIDE=7.875E-04
TFE =1.173E-02  DFE=4.551E-03  ZN =6.328E-06  PB   =7.744E-06  MN   =3.899E-03
COD =3.284E+00  CU =0.0        TDS=6.891E+00  BOD  =1.953E+00  HMET =4.891E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.923E+00  NOX  =3.585E-01  SOX=3.672E+00  HC  =1.322E+01  CO =2.521E+01
GFL =1.793E-01  PFL  =1.543E-01  AMM=1.440E-02  HMET=2.045E-02  ALD=1.065E-08
ORG =1.091E+01  SFIDE=6.403E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      652.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.137E-03  CYAN =1.817E-03  O&G =1.372E-02  PHEN=3.158E-04  TSS =7.209E-02
SFIDE=3.236E-04  FLIDE=2.485E-02  TI  =0.0        ZN  =1.410E-03  NITR=1.120E-02
PB   =8.226E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.295E-01  BOD  =1.008E-02  HMET=1.361E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.94 Van - Otto Turbo-Charged Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.856E+07  PET=6.323E+06  GAS=1.871E+07  ELEC=1.889E+07  HELEC=1.346E+06
OTH =3.603E+05  TOT=6.422E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.507E+00  NOX =6.161E+01  SOX =1.752E+00  HC=4.662E-01  CO=6.972E+00
ALD =6.525E-01  DACD=1.563E-04  HMET=4.313E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   44319.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.115E-03  TSS=2.237E+00  SFIDE=9.405E-06  FLIDE=1.527E-03
TFE =1.816E-02  DFE=1.050E-02  ZN =1.106E-05  PB   =1.295E-05  MN   =5.228E-03
COD =3.411E+00  CU =0.0        TDS=1.038E+01  BOD  =2.036E+00  HMET =2.819E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.799E+00  NOX  =3.697E-01  SOX=4.018E+00  HC  =8.496E+00  CO =3.350E+01
GFL =1.133E-01  PFL  =9.420E-02  AMM=2.775E-02  HMET=3.059E-02  ALD=1.065E-08
ORG =9.054E+00  SFIDE=8.564E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     729.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.633E-01  CYAN =2.859E-02  O&G =3.099E-02  PHEN=4.464E-03  TSS =3.714E-01
SFIDE=3.679E-04  FLIDE=8.692E-02  TI  =0.0        ZN  =1.729E-03  NITR=1.370E-02
PB   =1.020E-04  MN   =0.0        COD =2.842E-02  AL  =8.681E-03  CU  =2.480E-05
TDS  =4.863E-01  BOD  =1.896E-02  HMET=1.815E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.95 Van - Otto Turbo-Charged Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.643E+07  PET=7.450E+06  GAS=2.276E+07  ELEC=1.957E+07  HELEC=1.956E+06
OTH =3.307E+05  TOT=6.850E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.733E+00  NOX =5.343E+01  SOX =1.662E+00  HC=3.930E-01  CO=6.293E+00
ALD =6.343E-01  OACD=1.020E-04  HMET=3.175E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38326.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.040E-03  TSS=2.135E+00  SFIDE=8.122E-06  FLIDE=1.485E-03
TFE =1.573E-02  DFE=9.096E-03  ZN =7.832E-06  PB   =9.077E-06  MN   =4.535E-03
COD =3.318E+00  CU =0.0        TDS=1.217E+01  BOD  =1.977E+00  HMET =3.984E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.058E+01  NOX  =4.061E-01  SOX=3.971E+00  HC  =1.174E+01  CO =2.916E+01
GFL =1.786E-01  PFL  =1.523E-01  AMM=2.031E-02  HMET=2.174E-02  ALD=1.065E-08
DRG =8.819E+00  SFIDE=6.372E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      713.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.415E-01  CYAN =2.479E-02  O&G =2.996E-02  PHEN=3.907E-03  TSS =4.631E-01
SFIDE=3.346E-04  FLIDE=1.244E-01  TI  =0.0        ZN  =1.554E-03  NITR=1.234E-02
PB   =9.064E-05  MN   =0.0        COD =3.436E-02  AL  =1.404E-02  CU  =4.013E-05
TDS  =7.293E-01  BOD  =2.978E-02  HMET=1.354E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.96 Mini Auto - Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.019E+06  PET=3.957E+06  GAS=1.174E+07  ELEC=1.036E+07  HELEC=7.132E+05
OTH =2.334E+05  TOT=3.603E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.751E+00  NOX =3.539E+01  SOX =9.555E-01  HC=2.743E-01  CO=3.917E+00
ALD =3.502E-01  DACD=1.059E-04  HMET=2.415E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25462.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.338E-03  TSS=1.216E+00  SFIDE=1.445E-05  FLIDE=8.193E-04
TFE =1.043E-02  DFE=6.032E-03  ZN =1.031E-05  PB   =1.454E-05  MN   =3.001E-03
COD =1.830E+00  CU =0.0        TDS=6.725E+00  BOD  =1.091E+00  HMET =2.227E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.666E+00  NOX  =2.255E-01  SOX=2.521E+00  HC  =6.756E+00  CO =1.927E+01
GFL =6.270E-02  PFL  =5.194E-02  AMM=1.774E-02  HMET=2.994E-02  ALD=1.065E-08
ORG =4.885E+00  SFIDE=3.798E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      418.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.386E-02  CYAN =1.642E-02  O&G =1.895E-02  PHEN=2.550E-03  TSS =2.618E-01
SFIDE=2.038E-04  FLIDE=5.049E-02  TI  =0.0        ZN  =1.003E-03  NITR=7.904E-03
PB   =5.923E-05  MN   =0.0        COD =2.268E-02  AL  =1.085E-02  CU  =3.101E-05
TDS  =4.298E-01  BOD  =1.650E-02  HMET=8.064E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.97 Mini Auto - Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.895E+06  PET=3.472E+06  GAS=1.130E+07  ELEC=1.020E+07  HELEC=7.151E+05
OTH =1.948E+05  TOT=3.381E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.710E+00  NOX =2.600E+01  SOX =7.840E-01  HC=2.004E-01  CO=3.020E+00
ALD =2.968E-01  DACD=6.832E-05  HMET=1.950E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   18810.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.342E-04  TSS=9.719E-01  SFIDE=1.016E-05  FLIDE=3.723E-04
TFE =6.634E-03  DFE=2.363E-03  ZN =6.798E-06  PB   =9.646E-06  MN   =2.204E-03
COD =1.552E+00  CU =0.0        TDS=3.258E+00  BOD  =9.239E-01  HMET =2.464E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.047E+00  NOX  =1.703E-01  SOX=1.972E+00  HC  =6.440E+00  CO =1.418E+01
GFL =8.131E-02  PFL  =6.973E-02  AMM=1.202E-02  HMET=2.218E-02  ALD=1.065E-08
ORG =5.170E+00  SFIDE=3.226E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     343.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.609E-03  CYAN =9.415E-04  O&G =7.441E-03  PHEN=1.726E-04  TSS =3.736E-02
SFIDE=1.821E-04  FLIDE=1.333E-02  TI  =0.0        ZN  =7.483E-04  NITR=5.901E-03
PB   =4.436E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.255E-01  BOD  =4.774E-03  HMET=6.854E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.98 Mini Auto - Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=7.838E+06  PET=4.293E+06  GAS=1.292E+07  ELEC=1.135E+07  HELEC=8.823E+05
OTH =2.358E+05  TOT=3.753E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.024E+00  NOX =2.733E+01  SOX =8.749E-01  HC=2.055E-01  CO=3.262E+00
ALD =3.364E-01  DACD=5.795E-05  HMET=1.776E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19728.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.297E-04  TSS=1.091E+00  SFIDE=6.757E-06  FLIDE=4.221E-04
TFE =6.975E-03  DFE=2.568E-03  ZN =5.031E-06  PB   =6.766E-06  MN   =2.317E-03
COD =1.760E+00  CU =0.0        TDS=3.693E+00  BOD  =1.046E+00  HMET =2.484E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.087E+00  NOX  =1.919E-01  SOX=2.103E+00  HC  =7.149E+00  CO =1.495E+01
GFL =7.513E-02  PFL  =6.396E-02  AMM=1.110E-02  HMET=1.636E-02  ALD=1.065E-08
ORG =5.852E+00  SFIDE=3.253E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      354.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.842E-03  CYAN =1.024E-03  O&G =7.999E-03  PHEN=1.839E-04  TSS =3.952E-02
SFIDE=1.918E-04  FLIDE=1.380E-02  TI  =0.0        ZN  =8.136E-04  NITR=6.446E-03
PB   =4.769E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.293E-01  BOD  =5.359E-03  HMET=6.914E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.99 Mini Auto - Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.006E+06  PET=3.539E+06  GAS=1.050E+07  ELEC=9.402E+06  HELEC=6.076E+05
OTH =2.106E+05  TOT=3.019E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.358E+00  NOX =2.221E+01  SOX =7.449E-01  HC=1.631E-01  CO=2.709E+00
ALD =2.898E-01  DACD=3.691E-05  HMET=1.399E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   16018.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.080E-04  TSS=9.326E-01  SFIDE=3.782E-06  FLIDE=3.636E-04
TFE =5.668E-03  DFE=2.148E-03  ZN =3.338E-06  PB   =4.240E-06  MN   =1.883E-03
COD =1.516E+00  CU =0.0        TDS=3.182E+00  BOD  =9.012E-01  HMET =2.087E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.228E+00  NOX  =1.651E-01  SOX=1.739E+00  HC  =6.097E+00  CO =1.217E+01
GFL =6.428E-02  PFL  =5.480E-02  AMM=7.889E-03  HMET=1.075E-02  ALD=1.065E-08
ORG =5.037E+00  SFIDE=2.733E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     292.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.933E-03  CYAN =8.574E-04  O&G =6.570E-03  PHEN=1.512E-04  TSS =3.294E-02
SFIDE=1.561E-04  FLIDE=1.133E-02  TI  =0.0        ZN  =6.719E-04  NITR=5.333E-03
PB   =3.924E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.066E-01  BOD  =4.612E-03  HMET=5.810E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.100 Mini Auto - Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.194E+07  PET=3.629E+06  GAS=1.034E+07  ELEC=1.033E+07  HELEC=4.930E+05
OTH =2.434E+05  TOT=3.697E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.372E+00  NOX =4.204E+01  SOX =1.029E+00  HC=3.457E-01  CO=4.470E+00
ALD =3.650E-01  DACD=1.730E-04  HMET=3.017E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30323.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.757E-03  TSS=1.300E+00  SFIDE=1.339E-05  FLIDE=8.534E-04
TFE =1.241E-02  DFE=7.174E-03  ZN =1.236E-05  PB   =1.691E-05  MN   =3.563E-03
COD =1.907E+00  CU =0.0        TDS=5.805E+00  BOD  =1.138E+00  HMET =1.585E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.808E+00  NOX  =2.076E-01  SOX=2.651E+00  HC  =5.082E+00  CO =2.268E+01
GFL =4.319E-02  PFL  =3.457E-02  AMM=2.629E-02  HMET=3.524E-02  ALD=1.065E-08
ORG =5.089E+00  SFIDE=4.879E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      450.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.117E-01  CYAN =1.951E-02  O&G =1.974E-02  PHEN=3.001E-03  TSS =1.926E-01
SFIDE=2.203E-04  FLIDE=3.723E-02  TI  =0.0        ZN  =1.074E-03  NITR=8.451E-03
PB   =6.427E-05  MN   =0.0        COD =1.387E-02  AL  =3.180E-03  CU  =9.085E-06
TDS  =2.972E-01  BOD  =1.061E-02  HMET=1.034E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.101 Mini Auto - Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.038E+07  PET=4.178E+06  GAS=1.263E+07  ELEC=1.094E+07  HELEC=9.740E+05
OTH =2.116E+05  TOT=3.932E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.746E+00  NOX =3.565E+01  SOX =9.488E-01  HC=2.827E-01  CO=3.922E+00
ALD =3.461E-01  DACD=1.201E-04  HMET=2.301E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25642.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.233E-03  TSS=1.206E+00  SFIDE=1.220E-05  FLIDE=8.098E-04
TFE =1.051E-02  DFE=6.078E-03  ZN =9.146E-06  PB   =1.258E-05  MN   =3.022E-03
COD =1.809E+00  CU =0.0        TDS=6.654E+00  BOD  =1.079E+00  HMET =2.208E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.279E+00  NOX  =2.229E-01  SOX=2.512E+00  HC  =6.719E+00  CO =1.932E+01
GFL =8.950E-02  PFL  =7.590E-02  AMM=1.934E-02  HMET=2.629E-02  ALD=1.065E-08
ORG =4.826E+00  SFIDE=3.784E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      436.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.458E-02  CYAN =1.654E-02  O&G =1.856E-02  PHEN=2.565E-03  TSS =2.548E-01
SFIDE=1.991E-04  FLIDE=6.404E-02  TI  =0.0        ZN  =9.539E-04  NITR=7.525E-03
PB   =5.633E-05  MN   =0.0        COD =1.794E-02  AL  =6.995E-03  CU  =1.998E-05
TDS  =4.204E-01  BOD  =1.635E-02  HMET=8.033E-03  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.102 Small Auto - Diesel Engine Energy and Residuals
1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.243E+07  PET=3.991E+06  GAS=1.079E+07  ELEC=1.087E+07  HELEC=4.618E+05
OTH =2.492E+05  TOT=3.879E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.274E+00  NOX =4.045E+01  SOX =1.031E+00  HC=3.246E-01
ALD =3.707E-01  DACD=1.476E-04  HMET=2.881E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   29163.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.722E-03  TSS=1.305E+00  SFIDE=1.144E-05  FLIDE=8.669E-04
TFE =1.193E-02  DFE=6.900E-03  ZN =1.105E-05  PB   =1.483E-05  MN   =3.430E-03
COD =1.937E+00  CU =0.0        TDS=5.891E+00  BOD  =1.156E+00  HMET =1.597E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.490E+00  NOX  =2.105E-01  SOX=2.575E+00  HC  =5.055E+00  CO =2.191E+01
GFL =3.625E-02  PFL  =2.832E-02  AMM=2.321E-02  HMET=3.139E-02  ALD=1.065E-08
ORG =5.165E+00  SFIDE=4.838E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      435.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.074E-01  CYAN =1.877E-02  O&G =1.952E-02  PHEN=2.899E-03  TSS =1.917E-01
SFIDE=2.207E-04  FLIDE=3.362E-02  TI  =0.0        ZN  =1.081E-03  NITR=8.520E-03
PB   =6.442E-05  MN   =0.0        COD =1.516E-02  AL  =4.117E-03  CU  =1.176E-05
TDS  =2.949E-01  BOD  =1.075E-02  HMET=1.025E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.103 Small Auto - Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.002E+07  PET=4.404E+06  GAS=1.306E+07  ELEC=1.152E+07  HELEC=7.929E+05
OTH =2.593E+05  TOT=4.007E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.283E+00  NOX =3.932E+01  SOX =1.063E+00  HC=3.045E-01  CO=4.355E+00
ALD =3.899E-01  DACD=1.172E-04  HMET=2.677E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    28289.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.938E-03  TSS=1.353E+00  SFIDE=1.594E-05  FLIDE=9.122E-04
TFE =1.159E-02  DFE=6.702E-03  ZN =1.139E-05  PB   =1.606E-05  MN   =3.335E-03
COD =2.038E+00  CU =0.0        TDS=7.488E+00  BOD  =1.215E+00  HMET =2.479E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.297E+00  NOX  =2.510E-01  SOX=2.802E+00  HC  =7.517E+00  CO =2.142E+01
AFL =6.971E-02  PFL  =5.775E-02  AMM=1.965E-02  HMET=3.308E-02  ALD=1.065E-08
ORG =5.439E+00  SFIDE=4.281E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      465.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.043E-01  CYAN.=1.824E-02  O&G =2.107E-02  PHEN=2.834E-03  TSS =2.911E-01
SFIDE=2.267E-04  FLIDE=5.614E-02  TI  =0.0        ZN  =1.115E-03  NITR=8.787E-03
PB   =6.584E-05  MN   =0.0        COD =2.523E-02  AL  =1.207E-02  CU  =3.447E-05
TDS  =4.782E-01  BOD  =1.837E-02  HMET=8.960E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.104 Small Auto - Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.723E+06  PET=3.871E+06  GAS=1.260E+07  ELEC=1.137E+07  HELEC=7.973E+05
OTH =2.172E+05  TOT=3.770E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.136E+00  NOX =2.898E+01  SOX =8.743E-01  HC=2.233E-01  CO=3.367E+00
ALD =3.310E-01  DACD=7.609E-05  HMET=2.173E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   20969.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.949E-04  TSS=1.084E+00  SFIDE=1.130E-05  FLIDE=4.152E-04
TFE =7.396E-03  DFE=2.635E-03  ZN =7.570E-06  PB   =1.074E-05  MN   =2.457E-03
COD =1.731E+00  CU =0.0        TDS=3.633E+00  BOD  =1.030E+00  HMET =2.747E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.627E+00  NOX  =1.899E-01  SOX=2.199E+00  HC  =7.182E+00  CO =1.580E+01
GFL =9.065E-02  PFL  =7.775E-02  AMM=1.339E-02  HMET=2.470E-02  ALD=1.065E-08
ORG =5.766E+00  SFIDE=3.596E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      382.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.138E-03  CYAN =1.050E-03  O&G =8.296E-03  PHEN=1.925E-04  TSS =4.165E-02
SFIDE=2.030E-04  FLIDE=1.486E-02  TI  =0.0        ZN  =8.343E-04  NITR=6.580E-03
PB   =4.946E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.399E-01  BOD  =5.324E-03  HMET=7.641E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.105 Small Auto - Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.744E+06  PET=4.785E+06  GAS=1.441E+07  ELEC=1.265E+07  HELEC=9.838E+05
OTH =2.632E+05  TOT=4.185E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.488E+00  NOX =3.050E+01  SOX =9.752E-01  HC=2.295E-01  CO=3.638E+00
ALD =3.749E-01  DACD=6.495E-05  HMET=1.985E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22015.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.814E-04  TSS=1.216E+00  SFIDE=7.607E-06  FLIDE=4.704E-04
TFE =7.784E-03  DFE=2.864E-03  ZN =5.645E-06  PB   =7.603E-06  MN   =2.586E-03
COD =1.962E+00  CU =0.0        TDS=4.116E+00  BOD  =1.166E+00  HMET =2.772E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.675E+00  NOX  =2.139E-01  SOX=2.346E+00  HC  =7.969E+00  CO =1.669E+01
GFL =8.377E-02  PFL  =7.132E-02  AMM=1.242E-02  HMET=1.836E-02  ALD=1.065E-08
ORG =6.522E+00  SFIDE=3.629E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      395.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.404E-03  CYAN =1.142E-03  O&G =8.924E-03  PHEN=2.051E-04  TSS =4.408E-02
SFIDE=2.140E-04  FLIDE=1.539E-02  TI  =0.0        ZN  =9.077E-04  NITR=7.190E-03
PB   =5.321E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.442E-01  BOD  =5.972E-03  HMET=7.714E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.106 Small Auto-Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.681E+06  PET=3.944E+06  GAS=1.169E+07  ELEC=1.047E+07  HELEC=6.766E+05
OTH =2.343E+05  TOT=3.361E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.739E+00  NOX =2.471E+01  SOX =8.300E-01  HC=1.814E-01  CO=3.017E+00
ALD =3.230E-01  OACD=4.077E-05  HMET=1.552E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    17824.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.402E-04  TSS=1.039E+00  SFIDE=4.122E-06  FLIDE=4.053E-04
TFE =6.307E-03  DFE=2.392E-03  ZN =3.672E-06  PB   =4.649E-06  MN   =2.096E-03
COD =1.690E+00  CU =0.0        TDS=3.546E+00  BOD  =1.005E+00  HMET =2.322E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.706E+00  NOX  =1.840E-01  SOX=1.936E+00  HC  =6.793E+00  CO =1.354E+01
GFL =7.158E-02  PFL  =6.102E-02  AMM=8.746E-03  HMET=1.182E-02  ALD=1.065E-08
ORG =5.615E+00  SFIDE=3.040E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      325.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.376E-03  CYAN =9.548E-04  O&G =7.312E-03  PHEN=1.683E-04  TSS =3.667E-02
SFIDE=1.737E-04  FLIDE=1.262E-02  TI  =0.0        ZN  =7.479E-04  NITR=5.937E-03
PB   =4.367E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.186E-01  BOD  =5.140E-03  HMET=6.463E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.107 Small Auto - Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.326E+07  PET=4.035E+06  GAS=1.149E+07  ELEC=1.148E+07  HELEC=5.475E+05
OTH =2.701E+05  TOT=4.109E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.969E+00  NOX =4.667E+01  SOX =1.144E+00  HC=3.834E-01  CO=4.966E+00
ALD =4.062E-01  DACD=1.911E-04  HMET=3.344E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33658.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.174E-03  TSS=1.445E+00  SFIDE=1.474E-05  FLIDE=9.498E-04
TFE =1.377E-02  DFE=7.963E-03  ZN =1.364E-05  PB   =1.864E-05  MN   =3.955E-03
COD =2.122E+00  CU =0.0        TDS=6.460E+00  BOD  =1.267E+00  HMET =1.763E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.448E+00  NOX  =2.310E-01  SOX=2.944E+00  HC  =5.650E+00  CO =2.518E+01
GFL =4.797E-02  PFL  =3.839E-02  AMM=2.908E-02  HMET=3.889E-02  ALD=1.065E-08
ORG =5.663E+00  SFIDE=5.421E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      499.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.240E-01  CYAN =2.166E-02  O&G =2.193E-02  PHEN=3.332E-03  TSS =2.140E-01
SFIDE=2.449E-04  FLIDE=4.136E-02  TI  =0.0        ZN  =1.194E-03  NITR=9.392E-03
PB   =7.141E-05  MN   =0.0        COD =1.543E-02  AL  =3.531E-03  CU  =1.009E-05
TDS  =3.303E-01  BOD  =1.181E-02  HMET=1.149E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.108 Small Auto - Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.189E+07  PET=4.692E+06  GAS=1.427E+07  ELEC=1.243E+07  HELEC=1.115E+06
OTH =2.434E+05  TOT=4.464E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.404E+00  NOX =4.115E+01  SOX =1.066E+00  HC=3.303E-01  CO=4.476E+00
ALD =3.855E-01  DACD=1.487E-04  HMET=2.731E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    29613.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.914E-03  TSS=1.352E+00  SFIDE=1.572E-05  FLIDE=9.016E-04
TFE =1.214E-02  DFE=7.017E-03  ZN =1.140E-05  PB   =1.592E-05  MN   =3.488E-03
COD =2.014E+00  CU =0.0        TDS=7.419E+00  BOD  =1.202E+00  HMET =2.477E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.213E+00  NOX  =2.486E-01  SOX=2.878E+00  HC  =7.562E+00  CO =2.227E+01
GFL =1.024E-01  PFL  =8.690E-02  AMM=2.344E-02  HMET=3.288E-02  ALD=1.065E-08
DSG =5.378E+00  SFIDE=4.358E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      500.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.092E-01  CYAN =1.909E-02  O&G =2.116E-02  PHEN=2.953E-03  TSS =2.911E-01
SFIDE=2.251E-04  FLIDE=7.316E-02  TI  =0.0        ZN  =1.085E-03  NITR=8.549E-03
PB   =6.425E-05  MN   =0.0        COD =2.024E-02  AL  =8.008E-03  CU  =2.288E-05
TDS  =4.746E-01  BOD  =1.826E-02  HMET=9.252E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.109 Medium Auto - Diesel Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.294E+07  PET=7.369E+06  GAS=1.991E+07  ELEC=2.006E+07  HELEC=8.523E+05
OTH =4.598E+05  TOT=7.160E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.735E+00  NOX =7.465E+01  SOX =1.903E+00  HC=5.988E-01  CO=8.068E+00
ALD =6.846E-01  DACD=2.720E-04  HMET=5.314E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   53817.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.871E-03  TSS=2.411E+00  SFIDE=2.104E-05  FLIDE=1.601E-03
TFE =2.202E-02  DFE=1.273E-02  ZN =2.036E-05  PB   =2.729E-05  MN   =6.329E-03
COD =3.577E+00  CU =0.0        TDS=1.088E+01  BOD  =2.135E+00  HMET =2.949E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.013E+01  NOX  =3.888E-01  SOX=4.752E+00  HC  =9.332E+00  CO =4.043E+01
GFL =6.690E-02  PFL  =5.227E-02  AMM=4.279E-02  HMET=5.779E-02  ALD=1.065E-08
ORG =9.538E+00  SFIDE=8.931E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     804.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.982E-01  CYAN =3.464E-02  O&G =3.602E-02  PHEN=5.350E-03  TSS =3.539E-01
SFIDE=4.075E-04  FLIDE=6.205E-02  TI  =0.0        ZN  =1.996E-03  NITR=1.573E-02
PB   =1.189E-04  MN   =0.0        COD =2.799E-02  AL  =7.599E-03  CU  =2.171E-05
TDS  =5.444E-01  BOD  =1.985E-02  HMET=1.893E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.110 Medium Auto - Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.318E+07  PET=5.826E+06  GAS=1.725E+07  ELEC=1.520E+07  HELEC=1.045E+06
OTH =3.405E+05  TOT=5.286E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.966E+00  NOX =5.168E+01  SOX =1.406E+00  HC=3.992E-01  CO=5.739E+00
ALD =5.167E-01  DACD=1.513E-04  HMET=3.491E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37181.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.840E-03  TSS=1.791E+00  SFIDE=2.036E-05  FLIDE=1.209E-03
TFE =1.524E-02  DFE=8.809E-03  ZN =1.466E-05  PB   =2.059E-05  MN   =4.384E-03
COD =2.701E+00  CU =0.0        TDS=9.921E+00  BOD  =1.611E+00  HMET =3.280E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.286E+00  NOX  =3.326E-01  SOX=3.689E+00  HC  =9.940E+00  CO =2.816E+01
GFL =9.187E-02  PFL  =7.609E-02  AMM=2.552E-02  HMET=4.254E-02  ALD=1.065E-08
ORG =7.208E+00  SFIDE=5.551E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      612.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.371E-01  CYAN =2.398E-02  O&G =2.776E-02  PHEN=3.728E-03  TSS =3.836E-01
SFIDE=2.992E-04  FLIDE=7.401E-02  TI  =0.0        ZN  =1.469E-03  NITR=1.158E-02
PB   =8.669E-05  MN   =0.0        COD =3.333E-02  AL  =1.590E-02  CU  =4.543E-05
TDS  =6.315E-01  BOD  =2.433E-02  HMET=1.178E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table. B.111 Medium Auto - Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.128E+07  PET=5.073E+06  GAS=1.644E+07  ELEC=1.482E+07  HELEC=1.039E+06
OTH =2.813E+05  TOT=4.909E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.392E+00  NOX =3.754E+01  SOX =1.146E+00  HC=2.880E-01  CO=4.385E+00
ALD =4.353E-01  OACD=9.500E-05  HMET=2.763E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27156.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.426E-04  TSS=1.422E+00  SFIDE=1.368E-05  FLIDE=5.460E-04
TFE =9.581E-03  DFE=3.435E-03  ZN =9.341E-06  PB   =1.314E-05  MN   =3.183E-03
COD =2.277E+00  CU =0.0        TDS=4.778E+00  BOD  =1.355E+00  HMET =3.551E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.310E+00  NOX  =2.495E-01  SOX=2.858E+00  HC  =9.409E+00  CO =2.048E+01
GFL =1.181E-01  PFL  =1.013E-01  AMM=1.696E-02  HMET=3.042E-02  ALD=1.065E-08
ORG =7.580E+00  SFIDE=4.649E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     497.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.655E-03  CYAN =1.369E-03  O&G =1.078E-02  PHEN=2.499E-04  TSS =5.412E-02
SFIDE=2.631E-04  FLIDE=1.928E-02  TI  =0.0        ZN  =1.085E-03  NITR=8.563E-03
PB   =6.422E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.809E-01  BOD  =6.991E-03  HMET=9.877E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.112 Medium Auto - Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.162E+07  PET=6.412E+06  GAS=1.928E+07  ELEC=1.690E+07  HELEC=1.315E+06
OTH =3.487E+05  TOT=5.588E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.987E+00  NOX =4.046E+01  SOX =1.307E+00  HC=3.032E-01  CO=4.849E+00
ALD =5.036E-01  DACD=8.270E-05  HMET=2.595E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    29201.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.155E-04  TSS=1.630E+00  SFIDE=9.265E-06  FLIDE=6.318E-04
TFE =1.033E-02  DFE=3.821E-03  ZN =7.098E-06  PB   =9.438E-06  MN   =3.431E-03
COD =2.635E+00  CU =0.0        TDS=5.528E+00  BOD  =1.566E+00  HMET =3.682E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.553E+00  NOX  =2.872E-01  SOX=3.122E+00  HC  =1.068E+01  CO =2.214E+01
GFL =1.119E-01  PFL  =9.531E-02  AMM=1.609E-02  HMET=2.304E-02  ALD=1.065E-08
ORG =8.758E+00  SFIDE=4.821E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     526.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.168E-03  CYAN =1.524E-03  O&G =1.186E-02  PHEN=2.728E-04  TSS =5.869E-02
SFIDE=2.840E-04  FLIDE=2.045E-02  TI  =0.0        ZN  =1.208E-03  NITR=9.572E-03
PB   =7.072E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.913E-01  BOD  =8.016E-03  HMET=1.025E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.113 Medium Auto - Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.940E+06  PET=5.309E+06  GAS=1.570E+07  ELEC=1.406E+07  HELEC=9.086E+05
OTH =3.138E+05  TOT=4.512E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.023E+00  NOX =3.310E+01  SOX =1.118E+00  HC=2.424E-01  CO=4.051E+00
ALD =4.356E-01  DACD=5.304E-05  HMET=2.053E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    23869.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.419E-04  TSS=1.401E+00  SFIDE=5.057E-06  FLIDE=5.466E-04
TFE =8.448E-03  DFE=3.214E-03  ZN =4.692E-06  PB   =5.853E-06  MN   =2.807E-03
COD =2.279E+00  CU =0.0        TDS=4.783E+00  BOD  =1.355E+00  HMET =3.105E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.311E+00  NOX  =2.480E-01  SOX=2.597E+00  HC  =9.147E+00  CO =1.814E+01
GFL =9.613E-02  PFL  =8.194E-02  AMM=1.154E-02  HMET=1.507E-02  ALD=1.065E-08
ORG =7.571E+00  SFIDE=4.066E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      436.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.861E-03  CYAN =1.283E-03  O&G =9.805E-03  PHEN=2.256E-04  TSS =4.917E-02
SFIDE=2.327E-04  FLIDE=1.691E-02  TI  =0.0        ZN  =1.003E-03  NITR=7.967E-03
PB   =5.853E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.586E-01  BOD  =6.928E-03  HMET=8.643E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.114 Medium Auto - Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.622E+07  PET=5.142E+06  GAS=1.445E+07  ELEC=1.437E+07  HELEC=6.679E+05
OTH =3.220E+05  TOT=5.117E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.379E+00  NOX =5.598E+01  SOX =1.459E+00  HC=4.456E-01  CO=6.105E+00
ALD =5.289E-01  DACD=1.948E-04  HMET=3.804E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    40318.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.155E-03  TSS=1.851E+00  SFIDE=1.271E-05  FLIDE=1.237E-03
TFE =1.651E-02  DFE=9.546E-03  ZN =1.327E-05  PB   =1.725E-05  MN   =4.746E-03
COD =2.763E+00  CU =0.0        TDS=8.397E+00  BOD  =1.649E+00  HMET =2.257E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.792E+00  NOX  =2.999E-01  SOX=3.569E+00  HC  =7.120E+00  CO =3.030E+01
GFL =5.871E-02  PFL  =4.681E-02  AMM=3.107E-02  HMET=3.742E-02  ALD=1.065E-08
ORG =7.362E+00  SFIDE=6.708E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      608.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.486E-01  CYAN =2.597E-02  O&G =2.702E-02  PHEN=4.020E-03  TSS =2.630E-01
SFIDE=3.098E-04  FLIDE=5.108E-02  TI  =0.0        ZN  =1.486E-03  NITR=1.173E-02
PB   =8.827E-05  MN   =0.0        COD =1.975E-02  AL  =4.307E-03  CU  =1.231E-05
TDS  =4.092E-01  BOD  =1.529E-02  HMET=1.422E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.115 Medium Auto - Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.341E+07  PET=5.857E+06  GAS=1.731E+07  ELEC=1.465E+07  HELEC=1.262E+06
OTH =2.688E+05  TOT=5.276E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.294E+00  NOX =4.456E+01  SOX =1.328E+00  HC=3.338E-01  CO=5.148E+00
ALD =5.012E-01  DACD=1.012E-04  HMET=2.511E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31978.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.156E-03  TSS=1.701E+00  SFIDE=7.280E-06  FLIDE=1.173E-03
TFE =1.313E-02  DFE=7.589E-03  ZN =7.328E-06  PB   =8.957E-06  MN   =3.781E-03
COD =2.621E+00  CU =0.0        TDS=9.590E+00  BOD  =1.561E+00  HMET =3.112E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.018E+00  NOX  =3.207E-01  SOX=3.250E+00  HC  =9.337E+00  CO =2.428E+01
GFL =1.163E-01  PFL  =9.833E-02  AMM=1.874E-02  HMET=2.048E-02  ALD=1.065E-08
ORG =6.971E+00  SFIDE=4.774E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      560.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.181E-01  CYAN =2.067E-02  O&G =2.448E-02  PHEN=3.244E-03  TSS =3.334E-01
SFIDE=2.716E-04  FLIDE=8.376E-02  TI  =0.0        ZN  =1.270E-03  NITR=1.007E-02
PB   =7.417E-05  MN   =0.0        COD =2.470E-02  AL  =9.064E-03  CU  =2.590E-05
TDS  =5.772E-01  BOD  =2.341E-02  HMET=1.014E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.116 Large Auto - Diesel Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.742E+07  PET=8.914E+06  GAS=2.398E+07  ELEC=2.413E+07  HELEC=1.017E+06
OTH =5.433E+05  TOT=8.601E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.167E+01  NOX =8.870E+01  SOX =2.302E+00  HC=7.049E-01  CO=9.656E+00
ALD =8.329E-01  DACD=3.074E-04  HMET=6.208E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    63921.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.230E-03  TSS=2.920E+00  SFIDE=2.257E-05  FLIDE=1.948E-03
TFE =2.616E-02  DFE=1.513E-02  ZN =2.268E-05  PB   =2.993E-05  MN   =7.521E-03
COD =4.352E+00  CU =0.0        TDS=1.323E+01  BOD  =2.597E+00  HMET =3.570E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.206E+01  NOX  =4.727E-01  SOX=5.664E+00  HC  =1.125E+01  CO =4.808E+01
GFL =7.991E-02  PFL  =6.236E-02  AMM=4.909E-02  HMET=6.415E-02  ALD=1.065E-08
ORG =1.160E+01  SFIDE=1.070E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      959.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.354E-01  CYAN =4.116E-02  O&G =4.312E-02  PHEN=6.368E-03  TSS =4.233E-01
SFIDE=4.915E-04  FLIDE=7.434E-02  TI  =0.0        ZN  =2.394E-03  NITR=1.889E-02
PB   =1.424E-04  MN   =0.0        COD =3.384E-02  AL  =9.067E-03  CU  =2.591E-05
TDS  =6.527E-01  BOD  =2.412E-02  HMET=2.268E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.117 Large Auto - Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.584E+07  PET=7.049E+06  GAS=2.083E+07  ELEC=1.832E+07  HELEC=1.258E+06
OTH =4.079E+05  TOT=6.372E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.393E+00  NOX =6.201E+01  SOX =1.701E+00  HC=4.774E-01  CO=6.910E+00
ALD =6.266E-01  DACD=1.772E-04  HMET=4.145E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   44602.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.461E-03  TSS=2.167E+00  SFIDE=2.350E-05  FLIDE=1.466E-03
TFE =1.828E-02  DFE=1.057E-02  ZN =1.709E-05  PB   =2.391E-05  MN   =5.260E-03
COD =3.275E+00  CU =0.0        TDS=1.203E+01  BOD  =1.953E+00  HMET =3.970E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.957E+00  NOX  =4.030E-01  SOX=4.436E+00  HC  =1.202E+01  CO =3.379E+01
GFL =1.106E-01  PFL  =9.159E-02  AMM=3.014E-02  HMET=4.957E-02  ALD=1.065E-08
ORG =8.738E+00  SFIDE=6.665E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      736.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.645E-01  CYAN =2.877E-02  O&G =3.341E-02  PHEN=4.476E-03  TSS =4.618E-01
SFIDE=3.610E-04  FLIDE=8.912E-02  TI  =0.0        ZN  =1.768E-03  NITR=1.394E-02
PB   =1.042E-04  MN   =0.0        COD =4.025E-02  AL  =1.914E-02  CU  =5.468E-05
TDS  =7.623E-01  BOD  =2.948E-02  HMET=1.415E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.118 Large Auto - Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.359E+07  PET=6.178E+06  GAS=1.994E+07  ELEC=1.797E+07  HELEC=1.259E+06
OTH =3.392E+05  TOT=5.946E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.537E+00  NOX =4.528E+01  SOX =1.396E+00  HC=3.460E-01  CO=5.312E+00
ALD =5.317E-01  DACD=1.109E-04  HMET=3.277E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   32742.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.665E-04  TSS=1.734E+00  SFIDE=1.551E-05  FLIDE=6.669E-04
TFE =1.155E-02  DFE=4.165E-03  ZN =1.078E-05  PB   =1.505E-05  MN   =3.839E-03
COD =2.781E+00  CU =0.0        TDS=5.836E+00  BOD  =1.654E+00  HMET =4.275E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.838E+00  NOX  =3.045E-01  SOX=3.456E+00  HC  =1.146E+01  CO =2.471E+01
GFL =1.432E-01  PFL  =1.228E-01  AMM=2.004E-02  HMET=3.506E-02  ALD=1.065E-08
ORG =9.256E+00  SFIDE=5.596E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     600.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.025E-03  CYAN =1.660E-03  O&G =1.302E-02  PHEN=3.021E-04  TSS =6.544E-02
SFIDE=3.173E-04  FLIDE=2.329E-02  TI  =0.0        ZN  =1.313E-03  NITR=1.037E-02
PB   =7.761E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.178E-01  BOD  =8.529E-03  HMET=1.189E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.119 Large Auto - Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.368E+07  PET=7.561E+06  GAS=2.272E+07  ELEC=1.991E+07  HELEC=1.550E+06
OTH =4.105E+05  TOT=6.585E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.053E+00  NOX =4.763E+01  SOX =1.541E+00  HC=3.566E-01  CO=5.712E+00
ALD =5.939E-01  DACD=9.671E-05  HMET=3.047E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34375.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.203E-04   TSS=1.922E+00  SFIDE=1.075E-05  FLIDE=7.452E-04
TFE =1.216E-02  DFE=4.502E-03   ZN =8.282E-06  PB   =1.099E-05  MN   =4.039E-03
COD =3.107E+00  CU =0.0         TDS=6.521E+00  BOD  =1.847E+00  HMET =4.335E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.896E+00  NOX  =3.387E-01  SOX=3.677E+00  HC  =1.259E+01  CO =2.607E+01
GFL =1.319E-01  PFL  =1.123E-01  AMM=1.887E-02  HMET=2.687E-02  ALD=1.065E-08
ORG =1.033E+01  SFIDE=5.676E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      619.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.439E-03  CYAN =1.795E-03  O&G =1.397E-02  PHEN=3.212E-04  TSS =6.913E-02
SFIDE=3.344E-04  FLIDE=2.408E-02  TI  =0.0        ZN  =1.422E-03  NITR=1.127E-02
PB   =8.327E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.252E-01  BOD  =9.453E-03  HMET=1.207E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.120 Large Auto - Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.167E+07  PET=6.968E+06  GAS=2.057E+07  ELEC=1.840E+07  HELEC=1.190E+06
OTH =4.101E+05  TOT=5.907E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.581E+00  NOX =4.324E+01  SOX =1.468E+00  HC=3.161E-01  CO=5.306E+00
ALD =5.725E-01  DACD=6.750E-05  HMET=2.652E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31184.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.616E-04  TSS=1.840E+00  SFIDE=6.077E-06  FLIDE=7.185E-04
TFE =1.104E-02  DFE=4.210E-03  ZN =5.870E-06  PB   =7.221E-06  MN   =3.668E-03
COD =2.996E+00  CU =0.0        TDS=6.287E+00  BOD  =1.781E+00  HMET =4.052E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.255E+00  NOX  =3.259E-01  SOX=3.398E+00  HC  =1.201E+01  CO =2.370E+01
GFL =1.259E-01  PFL  =1.073E-01  AMM=1.488E-02  HMET=1.881E-02  ALD=1.065E-08
ORG =9.951E+00  SFIDE=5.305E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      571.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.658E-03  CYAN =1.681E-03  O&G =1.282E-02  PHEN=2.951E-04  TSS =6.432E-02
SFIDE=3.042E-04  FLIDE=2.211E-02  TI  =0.0        ZN  =1.313E-03  NITR=1.043E-02
PB   =7.653E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.070E-01  BOD  =9.103E-03  HMET=1.128E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.121 Large Auto - Diesel Engine Energy and Residuals, 1990, Technology Section C

```
TOTAL BTU BY FUEL TYPE
COAL=2.097E+07  PET=6.447E+06  GAS=1.830E+07  ELEC=1.826E+07  HELEC=8.657E+05
OTH =4.248E+05  TOT=6.528E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.467E+00  NOX =7.351E+01  SOX =1.829E+00  HC=5.996E-01  CO=7.866E+00
ALD =6.524E-01  OACD=2.906E-04  HMET=5.205E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   52996.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.619E-03  TSS=2.312E+00  SFIDE=2.171E-05  FLIDE=1.525E-03
TFE =2.169E-02  DFE=1.254E-02  ZN =2.055E-05  PB   =2.781E-05  MN   =6.229E-03
COD =3.408E+00  CU =0.0        TDS=1.037E+01  BOD  =2.034E+00  HMET =2.819E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.017E+01  NOX  =3.707E-01  SOX=4.648E+00  HC  =9.002E+00  CO =3.969E+01
AFL =7.591E-02  PFL  =6.070E-02  AMM=4.465E-02  HMET=5.847E-02  ALD=1.065E-08
ORG =9.092E+00  SFIDE=8.601E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     789.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.952E-01  CYAN =3.411E-02  O&G =3.476E-02  PHEN=5.255E-03  TSS =3.389E-01
SFIDE=3.906E-04  FLIDE=6.559E-02  TI  =0.0        ZN  =1.897E-03  NITR=1.493E-02
PB   =1.133E-04  MN   =0.0        COD =2.468E-02  AL  =5.584E-03  CU  =1.595E-05
TDS  =5.241E-01  BOD  =1.894E-02  HMET=1.822E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.122 Large Auto - Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.733E+07  PET=7.260E+06  GAS=2.170E+07  ELEC=1.858E+07  HELEC=1.628E+06
OTH =3.504E+05  TOT=6.685E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.023E+00  NOX =5.857E+01  SOX =1.648E+00  HC=4.523E-01  CO=6.597E+00
ALD =6.114E-01  DACD=1.669E-04  HMET=3.553E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   42085.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.981E-03  TSS=2.102E+00  SFIDE=1.508E-05  FLIDE=1.431E-03
TFE =1.726E-02  DFE=9.981E-03  ZN =1.247E-05  PB   =1.646E-05  MN   =4.968E-03
COD =3.196E+00  CU =0.0        TDS=1.173E+01  BOD  =1.905E+00  HMET =3.848E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.042E+01  NOX  =3.924E-01  SOX=4.196E+00  HC  =1.162E+01  CO =3.182E+01
GFL =1.498E-01  PFL  =1.269E-01  AMM=2.839E-02  HMET=3.548E-02  ALD=1.065E-08
ORG =8.514E+00  SFIDE=6.245E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      726.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.553E-01  CYAN =2.717E-02  O&G =3.129E-02  PHEN=4.237E-03  TSS =4.280E-01
SFIDE=3.412E-04  FLIDE=1.075E-01  TI  =0.0        ZN  =1.615E-03  NITR=1.278E-02
PB   =9.490E-05  MN   =0.0        COD =3.089E-02  AL  =1.169E-02  CU  =3.341E-05
TDS  =7.230E-01  BOD  =2.871E-02  HMET=1.326E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.123 Van - Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.811E+07  PET=7.778E+06  GAS=2.321E+07  ELEC=2.058E+07  HELEC=1.423E+06
OTH =4.721E+05  TOT=7.160E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.458E+00  NOX =7.128E+01  SOX =1.880E+00  HC=5.579E-01  CO=7.813E+00
ALD =6.839E-01  DACD=2.274E-04  HMET=5.008E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   51322.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.058E-02  TSS=2.389E+00  SFIDE=3.213E-05  FLIDE=1.600E-03
TFE =2.102E-02  DFE=1.215E-02  ZN =2.237E-05  PB   =3.192E-05  MN   =6.045E-03
COD =3.574E+00  CU =0.0        TDS=1.315E+01  BOD  =2.132E+00  HMET =4.376E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.137E+01  NOX  =4.410E-01  SOX=5.047E+00  HC  =1.331E+01  CO =3.880E+01
GFL =1.251E-01  PFL  =1.037E-01  AMM=3.729E-02  HMET=6.514E-02  ALD=1.065E-08
ORG =9.548E+00  SFIDE=7.637E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      840.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.891E-01  CYAN =3.308E-02  O&G =3.782E-02  PHEN=5.126E-03  TSS =5.225E-01
SFIDE=4.040E-04  FLIDE=1.006E-01  TI  =0.0        ZN  =2.003E-03  NITR=1.577E-02
PB   =1.186E-04  MN   =0.0        COD =4.485E-02  AL  =2.166E-02  CU  =6.189E-05
TDS  =8.507E-01  BOD  =3.230E-02  HMET=1.621E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.124 Van - Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.625E+07  PET=7.418E+06  GAS=2.390E+07  ELEC=2.154E+07  HELEC=1.509E+06
OTH =4.057E+05  TOT=7.124E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.836E+00  NOX =5.416E+01  SOX =1.676E+00  HC=4.133E-01  CO=6.365E+00
ALD =6.390E-01  DACD=1.310E-04  HMET=3.896E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39164.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.023E-03  TSS=2.083E+00  SFIDE=1.810E-05  FLIDE=8.016E-04
TFE =1.382E-02  DFE=4.992E-03  ZN =1.268E-05  PB   =1.765E-05  MN   =4.592E-03
COD =3.343E+00  CU =0.0        TDS=7.014E+00  BOD  =1.989E+00  HMET =5.110E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.058E+01  NOX  =3.659E-01  SOX=4.138E+00  HC  =1.375E+01  CO =2.956E+01
GFL =1.716E-01  PFL  =1.471E-01  AMM=2.379E-02  HMET=4.121E-02  ALD=1.065E-08
ORG =1.112E+01  SFIDE=6.690E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      718.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.600E-03  CYAN =1.990E-03  O&G =1.559E-02  PHEN=3.616E-04  TSS =7.836E-02
SFIDE=3.797E-04  FLIDE=2.788E-02  TI  =0.0        ZN  =1.572E-03  NITR=1.242E-02
PB   =9.291E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.603E-01  BOD  =1.025E-02  HMET=1.422E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.125 Van - Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.614E+07  PET=8.548E+06  GAS=2.591E+07  ELEC=2.289E+07  HELEC=1.776E+06
OTH =4.907E+05  TOT=7.577E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.164E+00  NOX =5.660E+01  SOX =1.745E+00  HC=4.324E-01  CO=6.639E+00
ALD =6.644E-01  DACD=1.383E-04  HMET=3.881E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    40890.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.012E-03  TSS=2.167E+00  SFIDE=1.836E-05  FLIDE=8.334E-04
TFE =1.444E-02  DFE=5.208E-03  ZN =1.249E-05  PB   =1.743E-05  MN   =4.798E-03
COD =3.475E+00  CU =0.0        TDS=7.292E+00  BOD  =2.067E+00  HMET =5.120E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.041E+01  NOX  =3.799E-01  SOX=4.304E+00  HC  =1.426E+01  CO =3.094E+01
GFL =1.513E-01  PFL  =1.288E-01  AMM=2.502E-02  HMET=4.085E-02  ALD=1.065E-08
ORG =1.156E+01  SFIDE=6.703E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      728.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.003E-02  CYAN =2.075E-03  O&G =1.644E-02  PHEN=3.777E-04  TSS =8.077E-02
SFIDE=3.967E-04  FLIDE=2.839E-02  TI  =0.0        ZN  =1.667E-03  NITR=1.318E-02
PB   =9.810E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.679E-01  BOD  =1.061E-02  HMET=1.425E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.126 Van - Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.367E+07  PET=7.832E+06  GAS=2.347E+07  ELEC=2.108E+07  HELEC=1.361E+06
OTH =4.773E+05  TOT=6.772E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.505E+00  NOX =5.036E+01  SOX =1.645E+00  HC=3.739E-01  CO=6.068E+00
ALD =6.360E-01  DACD=9.482E-05  HMET=3.358E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36353.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.958E-04  TSS=2.055E+00  SFIDE=1.186E-05  FLIDE=7.980E-04
TFE =1.285E-02  DFE=4.805E-03  ZN =9.175E-06  PB   =1.226E-05  MN   =4.271E-03
COD =3.328E+00  CU =0.0        TDS=6.983E+00  BOD  =1.979E+00  HMET =4.766E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.530E+00  NOX  =3.630E-01  SOX=3.914E+00  HC  =1.348E+01  CO =2.758E+01
GFL =1.440E-01  PFL  =1.227E-01  AMM=1.913E-02  HMET=2.978E-02  ALD=1.065E-03
ORG =1.106E+01  SFIDE=6.240E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      661.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.921E-03  CYAN =1.917E-03  O&G =1.482E-02  PHEN=3.409E-04  TSS =7.425E-02
SFIDE=3.537E-04  FLIDE=2.562E-02  TI  =0.0        ZN  =1.513E-03  NITR=1.199E-02
PB   =8.869E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.434E-01  BOD  =1.015E-02  HMET=1.326E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.127 Van - Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.939E+07  PET=6.319E+06  GAS=1.760E+07  ELEC=1.745E+07  HELEC=7.968E+05
OTH =3.780E+05  TOT=6.193E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.886E+00  NOX =6.599E+01  SOX =1.794E+00  HC=5.131E-01  CO=7.325E+00
ALD =6.589E-01  DACD=2.004E-04  HMET=4.308E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   47488.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.205E-03  TSS=2.283E+00  SFIDE=1.076E-05  FLIDE=1.542E-03
TFE =1.946E-02  DFE=1.125E-02  ZN =1.303E-05  PB   =1.598E-05  MN   =5.597E-03
COD =3.444E+00  CU =0.0        TDS=1.045E+01  BOD  =2.054E+00  HMET =2.783E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.236E+00  NOX  =3.730E-01  SOX=4.240E+00  HC  =8.687E+00  CO =3.580E+01
GFL =7.021E-02  PFL  =5.583E-02  AMM=3.337E-02  HMET=3.627E-02  ALD=1.065E-08
ORG =9.164E+00  SFIDE=8.083E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      724.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.751E-01  CYAN =3.062E-02  O&G =3.246E-02  PHEN=4.759E-03  TSS =3.155E-01
SFIDE=3.788E-04  FLIDE=6.148E-02  TI  =0.0        ZN  =1.798E-03  NITR=1.423E-02
PB   =1.063E-04  MN   =0.0        COD =2.434E-02  AL  =5.139E-03  CU  =1.468E-05
TDS  =4.935E-01  BOD  =1.898E-02  HMET=1.713E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.128 Van - Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.705E+07  PET=7.457E+06  GAS=2.202E+07  ELEC=1.863E+07  HELEC=1.605E+06
OTH =3.416E+05  TOT=6.712E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.006E+00  NOX =5.661E+01  SOX =1.691E+00  HC=4.235E-01  CO=6.547E+00
ALD =6.385E-01  DACD=1.273E-04  HMET=3.181E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   40623.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.108E-03  TSS=2.167E+00  SFIDE=9.040E-06  FLIDE=1.495E-03
TFE =1.667E-02  DFE=9.641E-03  ZN =9.202E-06  PB   =1.120E-05  MN   =4.803E-03
COD =3.339E+00  CU =0.0        TDS=1.222E+01  BOD  =1.989E+00  HMET =3.962E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.019E+01  NOX  =4.085E-01  SOX=4.131E+00  HC  =1.189E+01  CO =3.085E+01
GFL =1.479E-01  PFL  =1.250E-01  AMM=2.366E-02  HMET=2.570E-02  ALD=1.065E-08
ORG =8.880E+00  SFIDE=6.067E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     712.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.500E-01  CYAN =2.626E-02  O&G =3.113E-02  PHEN=4.122E-03  TSS =4.240E-01
SFIDE=3.456E-04  FLIDE=1.065E-01  TI  =0.0        ZN  =1.615E-03  NITR=1.281E-02
PB   =9.433E-05  MN   =0.0        COD =3.144E-02  AL  =1.152E-02  CU  =3.292E-05
TDS  =7.347E-01  BOD  =2.981E-02  HMET=1.289E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.129 Mini-Auto, Brayton Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.175E+06  PET=3.875E+06  GAS=1.124E+07  ELEC=9.546E+06  HELEC=6.096E+05
OTH =1.988E+05  TOT=3.365E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.329E+00  NOX =3.081E+01  SOX =9.047E-01  HC=2.282E-01  CO=3.536E+00
ALD =3.400E-01  DACD=6.595E-05  HMET=2.181E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22161.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.217E-03  TSS=1.158E+00  SFIDE=1.530E-05  FLIDE=7.958E-04
TFE =9.075E-03  DFE=5.248E-03  ZN =8.671E-06  PB   =1.203E-05  MN   =2.615E-03
COD =1.778E+00  CU =0.0        TDS=6.600E+00  BOD  =1.060E+00  HMET =2.201E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.964E+00  NOX  =2.201E-01  SOX=2.290E+00  HC  =6.530E+00  CO =1.684E+01
GFL =5.384E-02  PFL  =4.438E-02  AMM=1.252E-02  HMET=2.537E-02  ALD=1.065E-03
ORG =4.884E+00  SFIDE=3.585E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     370.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.163E-02  CYAN =1.430E-02  O&G =1.720E-02  PHEN=2.240E-03  TSS =2.321E-01
SFIDE=1.896E-04  FLIDE=4.406E-02  TI  =0.0        ZN  =9.092E-04  NITR=7.173E-03
PB   =5.365E-05  MN   =0.0        COD =2.051E-02  AL  =9.277E-03  CU  =2.651E-05
TDS  =4.207E-01  BOD  =1.639E-02  HMET=7.612E-03  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.130 Mini-Auto, Brayton Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=7.491E+06  PET=3.458E+06  GAS=1.127E+07  ELEC=9.596E+06  HELEC=6.372E+05
OTH =1.726E+05  TOT=3.272E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.417E+00  NOX =2.263E+01  SOX =7.521E-01  HC=1.648E-01  CO=2.749E+00
ALD =2.919E-01  DACD=3.524E-05  HMET=1.898E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    16400.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=5.258E-04  TSS=9.413E-01  SFIDE=1.353E-05  FLIDE=3.663E-04
TFE =5.776E-03  DFE=2.204E-03  ZN =6.736E-06  PB   =9.565E-06  MN   =1.920E-03
COD =1.527E+00  CU =0.0         TDS=3.205E+00  BOD  =9.083E-01  HMET =2.374E-05
ARS =0.0          CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.487E+00  NOX  =1.685E-01  SOX=1.821E+00  HC  =6.309E+00  CO =1.239E+01
GFL =7.249E-02  PFL  =6.211E-02  AMM=7.784E-03  HMET=2.224E-02  ALD=1.065E-08
ORG =5.217E+00  SFIDE=3.108E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      307.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.009E-03  CYAN =8.797E-04  O&G =6.675E-03  PHEN=1.545E-04  TSS =3.477E-02
SFIDE=1.592E-04  FLIDE=1.175E-02  TI  =0.0         ZN  =6.862E-04  NITR=5.405E-03
PB   =4.088E-05  MN   =0.0         COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =1.252E-01  BOD  =4.786E-03  HMET=6.604E-03  MO  =0.0         ARS =0.0
NI   =0.0         OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0          PET=0.0          GAS=0.0          ELEC=0.0          HELEC=0.0
OTH =0.0          TOT=0.0
```

Table B.131 Mini-Auto, Brayton Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=7.583E+06  PET=4.298E+06  GAS=1.285E+07  ELEC=1.110E+07  HELEC=8.440E+05
OTH =2.213E+05  TOT=3.691E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.904E+00  NOX =2.596E+01  SOX =8.610E-01  HC=1.913E-01  CO=3.150E+00
ALD =3.340E-01  DACD=4.500E-05  HMET=1.777E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    18750.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.308E-04  TSS=1.077E+00  SFIDE=8.917E-06  FLIDE=4.191E-04
TFE =6.627E-03  DFE=2.501E-03  ZN =5.050E-06  PB   =6.807E-06  MN   =2.202E-03
COD =1.748E+00  CU =0.0        TDS=3.667E+00  BOD  =1.039E+00  HMET =2.483E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.867E+00  NOX  =1.915E-01  SOX=2.046E+00  HC  =7.129E+00  CO =1.422E+01
GFL =7.187E-02  PFL  =6.117E-02  AMM=9.430E-03  HMET=1.658E-02  ALD=1.065E-08
ORG =5.895E+00  SFIDE=3.251E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      339.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.599E-03  CYAN =9.979E-04  O&G =7.669E-03  PHEN=1.764E-04  TSS =3.859E-02
SFIDE=1.825E-04  FLIDE=1.315E-02  TI  =0.0        ZN  =7.852E-04  NITR=6.218E-03
PB   =4.611E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.300E-01  BOD  =5.393E-03  HMET=6.911E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.132 Mini-Auto, Brayton Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.911E+06  PET=3.556E+06  GAS=1.061E+07  ELEC=9.291E+06  HELEC=5.329E+05
OTH =2.022E+05  TOT=3.009E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.273E+00  NOX =2.119E+01  SOX =7.363E-01  HC=1.522E-01  CO=2.629E+00
ALD =2.897E-01  DACD=2.638E-05  HMET=1.430E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    15300.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.259E-04  TSS=9.248E-01  SFIDE=5.857E-06  FLIDE=3.624E-04
TFF =5.410E-03  DFE=2.104E-03  ZN =3.637E-06  PB   =4.721E-06  MN   =1.798E-03
COD =1.511E+00  CU =0.0        TDS=3.171E+00  BOD  =8.983E-01  HMET =2.088E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.063E+00  NOX  =1.650E-01  SOX=1.700E+00  HC  =6.084E+00  CO =1.163E+01
SFL =6.167E-02  PFL  =5.256E-02  AMM=6.551E-03  HMET=1.186E-02  ALD=1.065E-03
ORG =5.078E+00  SFIDE=2.733E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      282.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.752E-03  CYAN =8.402E-04  O&G =6.332E-03  PHEN=1.458E-04  TSS =3.229E-02
SFIDE=1.493E-04  FLIDE=1.086E-02  TI  =0.0        ZN  =6.524E-04  NITR=5.173E-03
PB   =3.822E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.085E-01  BOD  =4.640E-03  HMET=5.810E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.133 Mini-Auto, Brayton Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.002E+07  PET=4.225E+06  GAS=1.253E+07  ELEC=1.042E+07  HELEC=3.394E+05
OTH =2.001E+05  TOT=3.824E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.531E+00  NOX =3.305E+01  SOX =9.263E-01  HC=2.525E-01  CO=3.717E+00
ALD =3.434E-01  DACD=8.915E-05  HMET=2.442E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23809.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.424E-03  TSS=1.182E+00  SFIDE=1.928E-05  FLIDE=8.036E-04
TFE =9.740E-03  DFE=5.632E-03  ZN =1.064E-05  PB   =1.493E-05  MN   =2.804E-03
COD =1.795E+00  CU =0.0        TDS=6.694E+00  BOD  =1.071E+00  HMET =2.255E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.744E+00  NOX  =2.231E-01  SOX=2.425E+00  HC  =6.732E+00  CO =1.797E+01
GFL =7.753E-02  PFL  =6.540E-02  AMM=1.547E-02  HMET=3.106E-02  ALD=1.065E-03
ORG =4.974E+00  SFIDE=3.791E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     407.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.762E-02  CYAN =1.533E-02  O&G =1.783E-02  PHEN=2.391E-03  TSS =2.335E-01
SFIDE=1.949E-04  FLIDE=5.661E-02  TI  =0.0        ZN  =9.252E-04  NITR=7.278E-03
PB   =5.503E-05  MN   =0.0        COD =1.670E-02  AL  =6.028E-03  CU  =1.722E-05
TDS  =4.355E-01  BOD  =1.672E-02  HMET=8.049E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.134 Small Auto, Brayton Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.068E+06  PET=4.307E+06  GAS=1.248E+07  ELEC=1.060E+07  HELEC=6.777E+05
OTH =2.205E+05  TOT=3.737E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.808E+00  NOX =3.418E+01  SOX =1.006E+00  HC=2.529E-01  CO=3.927E+00
ALD =3.782E-01  DACD=7.254E-05  HMET=2.406E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   24584.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.791E-03  TSS=1.288E+00  SFIDE=1.667E-05  FLIDE=8.854E-04
TFE =1.007E-02  DFE=5.822E-03  ZN =9.496E-06  PB   =1.314E-05  MN   =2.901E-03
COD =1.978E+00  CU =0.0        TDS=7.340E+00  BOD  =1.179E+00  HMET =2.445E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.511E+00  NOX  =2.447E-01  SOX=2.541E+00  HC  =7.256E+00  CO =1.868E+01
GFL =5.985E-02  PFL  =4.933E-02  AMM=1.383E-02  HMET=2.777E-02  ALD=1.065E-08
ORG =5.430E+00  SFIDE=3.973E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     411.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.056E-02  CYAN =1.586E-02  O&G =1.910E-02  PHEN=2.486E-03  TSS =2.573E-01
SFIDE=2.107E-04  FLIDE=4.896E-02  TI  =0.0        ZN  =1.009E-03  NITR=7.965E-03
PB   =5.955E-05  MN   =0.0        COD =2.281E-02  AL  =1.031E-02  CU  =2.946E-05
TDS  =4.671E-01  BOD  =1.822E-02  HMET=8.436E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.135 Small Auto, Brayton Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.361E+06  PET=3.860E+06  GAS=1.258E+07  ELEC=1.071E+07  HELEC=7.113E+05
OTH =1.926E+05  TOT=3.653E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.814E+00  NOX =2.526E+01  SOX =8.396E-01  HC=1.839E-01  CO=3.069E+00
ALD =3.259E-01  DACD=3.933E-05  HMET=2.119E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   18306.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.868E-04  TSS=1.051E+00  SFIDE=1.510E-05  FLIDE=4.089E-04
TFE =6.447E-03  DFE=2.460E-03  ZN =7.517E-06  PB   =1.067E-05  MN   =2.143E-03
COD =1.705E+00  CU =0.0        TDS=3.578E+00  BOD  =1.014E+00  HMET =2.650E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.009E+00  NOX  =1.880E-01  SOX=2.033E+00  HC  =7.042E+00  CO =1.383E+01
GFL =8.092E-02  PFL  =6.933E-02  AMM=8.688E-03  HMET=2.482E-02  ALD=1.065E-08
ORG =5.824E+00  SFIDE=3.469E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      342.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.475E-03  CYAN =9.820E-04  O&G =7.451E-03  PHEN=1.725E-04  TSS =3.882E-02
SFIDE=1.777E-04  FLIDE=1.311E-02  TI  =0.0        ZN  =7.659E-04  NITR=6.033E-03
PB   =4.563E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.398E-01  BOD  =5.342E-03  HMET=7.371E-03  MO  =0.0        HPS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.136 Small Auto, Brayton Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.424E+06  PET=4.781E+06  GAS=1.430E+07  ELEC=1.235E+07  HELEC=9.391E+05
OTH =2.458E+05  TOT=4.104E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.340E+00  NOX =2.884E+01  SOX =9.580E-01  HC=2.124E-01  CO=3.503E+00
ALD =3.718E-01  DACD=4.963E-05  HMET=1.966E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    20830.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.742E-04  TSS=1.199E+00  SFIDE=9.715E-06  FLIDE=4.665E-04
TFE =7.362E-03  DFE=2.780E-03  ZN =5.539E-06  PB   =7.445E-06  MN   =2.446E-03
COD =1.945E+00  CU =0.0        TDS=4.082E+00  BOD  =1.157E+00  HMET =2.757E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.411E+00  NOX  =2.131E-01  SOX=2.273E+00  HC  =7.929E+00  CO =1.580E+01
GFL =7.996E-02  PFL  =6.807E-02  AMM=1.044E-02  HMET=1.818E-02  ALD=1.065E-03
ORG =6.559E+00  SFIDE=3.609E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      377.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.109E-03  CYAN =1.109E-03  O&G =8.522E-03  PHEN=1.961E-04  TSS =4.288E-02
SFIDE=2.028E-04  FLIDE=1.462E-02  TI  =0.0        ZN  =8.726E-04  NITR=6.911E-03
PB   =5.122E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.442E-01  BOD  =6.000E-03  HMET=7.672E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.137 Small Auto, Brayton Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.577E+06  PET=3.962E+06  GAS=1.182E+07  ELEC=1.035E+07  HELEC=6.498E+05
OTH =2.252E+05  TOT=3.350E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.648E+00  NOX =2.361E+01  SOX =8.208E-01  HC=1.695E-01  CO=2.930E+00
ALD =3.220E-01  DACD=2.929E-05  HMET=1.585E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   17042.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.589E-04  TSS=1.031E+00  SFIDE=6.352E-06  FLIDE=4.041E-04
TFE =6.026E-03  DFE=2.344E-03  ZN =3.986E-06  PB   =5.153E-06  MN   =2.003E-03
COD =1.685E+00  CU =0.0        TDS=3.536E+00  BOD  =1.002E+00  HMET =2.322E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.527E+00  NOX  =1.840E-01  SOX=1.894E+00  HC  =6.780E+00  CO =1.295E+01
GFL =6.875E-02  PFL  =5.859E-02  AMM=7.286E-03  HMET=1.299E-02  ALD=1.065E-08
ORG =5.660E+00  SFIDE=3.039E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     314.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.180E-03  CYAN =9.362E-04  O&G =7.054E-03  PHEN=1.624E-04  TSS =3.596E-02
SFIDE=1.663E-04  FLIDE=1.209E-02  TI  =0.0        ZN  =7.267E-04  NITR=5.763E-03
PB   =4.256E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.206E-01  BOD  =5.172E-03  HMET=6.462E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.138 Small Auto, Brayton Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.110E+07  PET=4.692E+06  GAS=1.391E+07  ELEC=1.157E+07  HELEC=9.328E+05
OTH =2.217E+05  TOT=4.243E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.027E+00  NOX =3.660E+01  SOX =1.030E+00  HC=2.792E-01  CO=4.123E+00
ALD =3.822E-01  DACD=9.756E-05  HMET=2.683E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   26365.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.014E-03  TSS=1.315E+00  SFIDE=2.088E-05  FLIDE=8.943E-04
TFE =1.079E-02  DFE=6.237E-03  ZN =1.158E-05  PB   =1.622E-05  MN   =3.105E-03
COD =1.998E+00  CU =0.0        TDS=7.446E+00  BOD  =1.192E+00  HMET =2.505E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.369E+00  NOX  =2.482E-01  SOX=2.687E+00  HC  =7.476E+00  CO =1.990E+01
GFL =8.616E-02  PFL  =7.268E-02  AMM=1.701E-02  HMET=3.379E-02  ALD=1.065E-08
ORG =5.529E+00  SFIDE=4.193E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     451.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.703E-02  CYAN =1.698E-02  O&G =1.978E-02  PHEN=2.649E-03  TSS =2.592E-01
SFIDE=2.163E-04  FLIDE=6.289E-02  TI  =0.0        ZN  =1.026E-03  NITR=8.076E-03
PB   =6.100E-05  MN   =0.0        COD =1.858E-02  AL  =6.698E-03  CU  =1.914E-05
TDS  =4.830E-01  BOD  =1.858E-02  HMET=8.903E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.139 Medium Auto, Brayton Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.182E+07  PET=5.664E+06  GAS=1.638E+07  ELEC=1.391E+07  HELEC=8.922E+05
OTH =2.874E+05  TOT=4.898E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.308E+00  NOX =4.462E+01  SOX =1.326E+00  HC=3.288E-01  CO=5.148E+00
ALD =5.000E-01  DACD=9.103E-05  HMET=3.064E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   32079.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.579E-03  TSS=1.699E+00  SFIDE=2.001E-05  FLIDE=1.170E-03
TFE =1.314E-02  DFE=7.600E-03  ZN =1.166E-05  PB   =1.598E-05  MN   =3.787E-03
COD =2.615E+00  CU =0.0        TDS=9.687E+00  BOD  =1.559E+00  HMET =3.215E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.212E+00  NOX  =3.231E-01  SOX=3.321E+00  HC  =9.540E+00  CO =2.440E+01
GFL =7.879E-02  PFL  =6.494E-02  AMM=1.764E-02  HMET=3.402E-02  ALD=1.065E-03
ORG =7.156E+00  SFIDE=5.161E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     537.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.182E-01  CYAN =2.071E-02  O&G =2.501E-02  PHEN=3.248E-03  TSS =3.385E-01
SFIDE=2.767E-04  FLIDE=6.442E-02  TI  =0.0        ZN  =1.322E-03  NITR=1.044E-02
PB   =7.783E-05  MN   =0.0        COD =3.009E-02  AL  =1.358E-02  CU  =3.879E-05
TDS  =6.117E-01  BOD  =2.401E-02  HMET=1.096E-02  MO  =0.0        AGS =0.0
NT   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.140 Medium Auto, Brayton Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.076E+07  PET=5.041E+06  GAS=1.632E+07  ELEC=1.396E+07  HELEC=9.322E+05
OTH =2.503E+05  TOT=4.742E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.985E+00  NOX =3.289E+01  SOX =1.101E+00  HC=2.392E-01  CO=4.009E+00
ALD =4.282E-01  DACD=4.994E-05  HMET=2.657E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23823.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.168E-04  TSS=1.379E+00  SFIDE=1.765E-05  FLIDE=5.373E-04
TFE =8.396E-03  DFE=3.211E-03  ZN =9.032E-06  PB   =1.268E-05  MN   =2.791E-03
COD =2.241E+00  CU =0.0        TDS=4.702E+00  BOD  =1.333E+00  HMET =3.406E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.537E+00  NOX  =2.466E-01  SOX=2.644E+00  HC  =9.210E+00  CO =1.801E+01
GFL =1.061E-01  PFL  =9.086E-02  AMM=1.117E-02  HMET=2.974E-02  ALD=1.065E-08
ORG =7.628E+00  SFIDE=4.459E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     446.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.826E-03  CYAN =1.282E-03  O&G =9.712E-03  PHEN=2.248E-04  TSS =5.043E-02
SFIDE=2.314E-04  FLIDE=1.710E-02  TI  =0.0        ZN  =9.979E-04  NITR=7.870E-03
PB   =5.928E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.791E-01  BOD  =6.992E-03  HMET=9.476E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.141 Medium Auto, Brayton Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.117E+07  PET=6.390E+06  GAS=1.908E+07  ELEC=1.647E+07  HELEC=1.258E+06
OTH =3.259E+05  TOT=5.471E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.787E+00  NOX =3.825E+01  SOX =1.283E+00  HC=2.807E-01  CO=4.666E+00
ALD =4.989E-01  OACD=6.285E-05  HMET=2.539E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27616.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.933E-04  TSS=1.606E+00  SFIDE=1.131E-05  FLIDE=6.261E-04
TFF =9.765E-03  DFF=3.706E-03  ZN =6.762E-06  PB   =8.920E-06  MN   =3.245E-03
COD =2.611E+00  CU =0.0        TDS=5.479E+00  BOD  =1.552E+00  HMET =3.641E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.203E+00  NOX  =2.856E-01  SOX=3.020E+00  HC  =1.060E+01  CO =2.096E+01
GFL =1.071E-01  PFL  =9.115E-02  AMM=1.351E-02  HMET=2.212E-02  ALD=1.065E-03
ORG =8.784E+00  SFIDE=4.767E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     502.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.775E-03  CYAN =1.479E-03  O&G =1.132E-02  PHEN=2.605E-04  TSS =5.697E-02
SFIDE=2.690E-04  FLIDE=1.942E-02  TI  =0.0        ZN  =1.160E-03  NITR=9.194E-03
PB   =6.797E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.899E-01  BOD  =8.031E-03  HMET=1.013E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.142 Medium Auto, Brayton Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.803E+06  PET=5.330E+06  GAS=1.584E+07  ELEC=1.390E+07  HELEC=8.756E+05
OTH =3.025E+05  TOT=4.495E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.910E+00  NOX =3.173E+01  SOX =1.106E+00  HC=2.277E-01  CO=3.944E+00
ALD =4.343E-01  DACD=3.886E-05  HMET=2.086E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    22896.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.618E-04  TSS=1.390E+00  SFIDE=7.672E-06  FLIDE=5.451E-04
TFE =8.099E-03  DFE=3.154E-03  ZN =5.029E-06  PB   =6.397E-06  MN   =2.692E-03
COD =2.273E+00  CU =0.0        TDS=4.770E+00  BOD  =1.351E+00  HMET =3.100E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.089E+00  NOX  =2.480E-01  SOX=2.544E+00  HC  =9.128E+00  CO =1.741E+01
GFL =9.264E-02  PFL  =7.895E-02  AMM=9.735E-03  HMET=1.635E-02  ALD=1.065E-08
ORG =7.625E+00  SFIDE=4.059E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      422.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.617E-03  CYAN =1.259E-03  O&G =9.483E-03  PHEN=2.184E-04  TSS =4.827E-02
SFIDE=2.235E-04  FLIDE=1.626E-02  TI  =0.0        ZN  =9.767E-04  NITR=7.750E-03
PB   =5.713E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.608E-01  BOD  =6.965E-03  HMET=8.630E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.143 Medium Auto, Brayton Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.324E+07  PET=5.895E+06  GAS=1.728E+07  ELEC=1.437E+07  HELEC=1.184E+06
OTH =2.642E+05  TOT=5.224E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.180E+00  NOX =4.316E+01  SOX =1.317E+00  HC=3.172E-01  CO=5.038E+00
ALD =4.999E-01  DACD=8.384E-05  HMET=2.619E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   30993.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.290E-03  TSS=1.689E+00  SFIDE=1.189E-05  FLIDE=1.170E-03
TFE =1.271E-02  DFE=7.349E-03  ZN =8.388E-06  PB   =1.062E-05  MN   =3.663E-03
COD =2.615E+00  CU =0.0        TDS=9.624E+00  BOD  =1.558E+00  HMET =3.145E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.719E+00  NOX  =3.212E-01  SOX=3.207E+00  HC  =9.362E+00  CO =2.355E+01
GFL =1.093E-01  PFL  =9.220E-02  AMM=1.658E-02  HMET=2.384E-02  ALD=1.065E-03
ORG =7.068E+00  SFIDE=4.799E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      544.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.143E-01  CYAN =2.002E-02  O&G =2.411E-02  PHEN=3.150E-03  TSS =3.214E-01
SFIDE=2.696E-04  FLIDE=7.946E-02  TI  =0.0        ZN  =1.255E-03  NITR=9.947E-03
PB   =7.360E-05  MN   =0.0        COD =2.399E-02  AL  =8.500E-03  CU  =2.429E-05
TDS  =5.877E-01  BOD  =2.366E-02  HMET=1.019E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.144 Large Auto, Brayton Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.418E+07  PET=6.840E+06  GAS=1.976E+07  ELEC=1.677E+07  HELEC=1.078E+06
OTH =3.447E+05  TOT=5.899E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.603E+00  NOX =5.356E+01  SOX =1.604E+00  HC=3.933E-01  CO=6.202E+00
ALD =6.062E-01  DACD=1.057E-04  HMET=3.603E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38494.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=9.117E-03  TSS=2.056E+00  SFIDE=2.233E-05  FLIDE=1.419E-03
TFE =1.577E-02  DFE=9.122E-03  ZN =1.329E-05  PB   =1.804E-05  MN   =4.547E-03
COD =3.170E+00  CU =0.0        TDS=1.173E+01  BOD  =1.889E+00  HMET =3.882E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.675E+00  NOX  =3.913E-01  SOX=3.990E+00  HC  =1.152E+01  CO =2.929E+01
GFL =9.522E-02  PFL  =7.848E-02  AMM=2.078E-02  HMET=3.870E-02  ALD=1.065E-08
ORG =8.656E+00  SFIDE=6.171E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      646.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.419E-01  CYAN =2.485E-02  O&G =3.010E-02  PHEN=3.902E-03  TSS =4.081E-01
SFIDE=3.338E-04  FLIDE=7.781E-02  TI  =0.0        ZN  =1.590E-03  NITR=1.257E-02
PB   =9.352E-05  MN   =0.0        COD =3.642E-02  AL  =1.641E-02  CU  =4.688E-05
TDS  =7.360E-01  BOD  =2.902E-02  HMET=1.311E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.145 Large Auto, Brayton Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.296E+07  PET=6.132E+06  GAS=1.976E+07  ELEC=1.697E+07  HELEC=1.137E+06
OTH =3.034E+05  TOT=5.744E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.066E+00  NOX =3.993E+01  SOX =1.344E+00  HC=2.900E-01  CO=4.879E+00
ALD =5.231E-01  DACD=5.953E-05  HMET=3.139E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   28907.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.296E-04  TSS=1.683E+00  SFIDE=1.972E-05  FLIDE=6.564E-04
TEF =1.019E-02  DFE=3.905E-03  ZN =1.032E-05  PB   =1.434E-05  MN   =3.388E-03
COD =2.737E+00  CU =0.0        TDS=5.744E+00  BOD  =1.628E+00  HMET =4.097E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.947E+00  NOX  =3.009E-01  SOX=3.207E+00  HC  =1.121E+01  CO =2.187E+01
GFL =1.293E-01  PFL  =1.108E-01  AMM=1.344E-02  HMET=3.389E-02  ALD=1.065E-08
ORG =9.298E+00  SFIDE=5.364E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     542.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.072E-03  CYAN =1.559E-03  O&G =1.180E-02  PHEN=2.730E-04  TSS =6.113E-02
SFIDE=2.810E-04  FLIDE=2.077E-02  TI  =0.0        ZN  =1.212E-03  NITR=9.565E-03
PB   =7.186E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.150E-01  BOD  =8.519E-03  HMET=1.140E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL =0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0         TOT=0.0
```

Table B.146 Large Auto, Brayton Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.310E+07  PET=7.514E+06  GAS=2.242E+07  ELEC=1.936E+07  HELEC=1.480E+06
OTH =3.823E+05  TOT=6.427E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.798E+00  NOX =4.487E+01  SOX =1.509E+00  HC=3.288E-01  CO=5.481E+00
ALD =5.874E-01  DACD=7.262E-05  HMET=2.953E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   32389.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.829E-04  TSS=1.890E+00  SFIDE=1.269E-05  FLIDE=7.371E-04
TFE =1.145E-02  DFE=4.353E-03  ZN =7.717E-06  PB   =1.011E-05  MN   =3.806E-03
COD =3.074E+00  CU =0.0        TDS=6.450E+00  BOD  =1.827E+00  HMET =4.265E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.459E+00  NOX  =3.360E-01  SOX=3.544E+00  HC  =1.246E+01  CO =2.459E+01
GFL =1.260E-01  PFL  =1.072E-01  AMM=1.573E-02  HMET=2.521E-02  ALD=1.065E-08
ORG =1.033E+01  SFIDE=5.584E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     589.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.947E-03  CYAN =1.737E-03  O&G =1.329E-02  PHEN=3.058E-04  TSS =6.686E-02
SFIDE=3.155E-04  FLIDE=2.280E-02  TI  =0.0        ZN  =1.362E-03  NITR=1.079E-02
PB   =7.974E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.223E-01  BOD  =9.447E-03  HMET=1.187E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.147 Large Auto, Brayton Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.146E+07  PET=6.971E+06  GAS=2.066E+07  ELEC=1.815E+07  HELEC=1.147E+06
OTH =3.950E+05  TOT=5.864E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.425E+00  NOX =4.146E+01  SOX =1.450E+00  HC=2.973E-01  CO=5.161E+00
ALD =5.696E-01  DACD=5.012E-05  HMET=2.669E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   29910.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.770E-04  TSS=1.823E+00  SFIDE=8.910E-06  FLIDE=7.149E-04
TFE =1.058E-02  DFE=4.125E-03  ZN =6.150E-06  PB   =7.677E-06  MN   =3.517E-03
COD =2.981E+00  CU =0.0        TDS=6.255E+00  BOD  =1.772E+00  HMET =4.026E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.963E+00  NOX  =3.250E-01  SOX=3.322E+00  HC  =1.195E+01  CO =2.275E+01
GFL =1.214E-01  PFL  =1.034E-01  AMM=1.265E-02  HMET=1.992E-02  ALD=1.065E-08
ORG =9.988E+00  SFIDE=5.271E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     551.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.339E-03  CYAN =1.647E-03  O&G =1.240E-02  PHEN=2.855E-04  TSS =6.300E-02
SFIDE=2.920E-04  FLIDE=2.126E-02  TI  =0.0        ZN  =1.276E-03  NITR=1.013E-02
PB   =7.457E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.085E-01  BOD  =9.120E-03  HMET=1.121E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.148 Large Auto, Brayton Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.685E+07  PET=7.306E+06  GAS=2.154E+07  ELEC=1.791E+07  HELEC=1.460E+06
OTH =3.363E+05  TOT=6.540E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.744E+00  NOX =5.523E+01  SOX =1.618E+00  HC=4.138E-01  CO=6.332E+00
ALD =6.074E-01  DACD=1.278E-04  HMET=3.709E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   39725.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.199E-03  TSS=2.071E+00  SFIDE=2.356E-05  FLIDE=1.422E-03
TFE =1.627E-02  DFE=9.408E-03  ZN =1.419E-05  PB   =1.917E-05  MN   =4.686E-03
COD =3.176E+00  CU =0.0        TDS=1.176E+01  BOD  =1.893E+00  HMET =3.900E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.742E+00  NOX  =3.923E-01  SOX=4.079E+00  HC  =1.162E+01  CO =3.009E+01
GFL =1.348E-01  PFL  =1.137E-01  AMM=2.350E-02  HMET=4.100E-02  ALD=1.065E-08
ORG =8.686E+00  SFIDE=6.237E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     689.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.463E-01  CYAN =2.563E-02  O&G =3.034E-02  PHEN=4.013E-03  TSS =4.010E-01
SFIDE=3.355E-04  FLIDE=9.821E-02  TI  =0.0        ZN  =1.577E-03  NITR=1.245E-02
PB   =9.310E-05  MN   =0.0        COD =2.934E-02  AL  =1.048E-02  CU  =2.995E-05
TDS  =7.402E-01  BOD  =2.913E-02  HMET=1.324E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.149 Van - Brayton Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.562E+07  PET=7.422E+06  GAS=2.151E+07  ELEC=1.827E+07  HELEC=1.168E+06
OTH =3.800E+05  TOT=6.440E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.286E+00  NOX =5.891E+01  SOX =1.734E+00  HC=4.358E-01  CO=6.768E+00
ALD =6.519E-01  DACD=1.250E-04  HMET=4.146E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   42368.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.981E-03  TSS=2.220E+00  SFIDE=2.871E-05  FLIDE=1.526E-03
TFE =1.735E-02  DFE=1.003E-02  ZN =1.635E-05  PB   =2.263E-05  MN   =5.000E-03
COD =3.409E+00  CU =0.0        TDS=1.265E+01  BOD  =2.032E+00  HMET =4.215E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.497E+00  NOX  =4.218E-01  SOX=4.379E+00  HC  =1.251E+01  CO =3.220E+01
GFL =1.032E-01  PFL  =8.501E-02  AMM=2.382E-02  HMET=4.782E-02  ALD=1.065E-08
ORG =9.359E+00  SFIDE=6.846E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     708.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.561E-01  CYAN =2.733E-02  O&G =3.291E-02  PHEN=4.284E-03  TSS =4.444E-01
SFIDE=3.631E-04  FLIDE=8.439E-02  TI  =0.0        ZN  =1.740E-03  NITR=1.373E-02
PB   =1.026E-04  MN   =0.0        COD =3.931E-02  AL  =1.777E-02  CU  =5.078E-05
TDS  =8.050E-01  BOD  =3.141E-02  HMET=1.454E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.150 Van - Brayton Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.567E+07  PET=7.382E+06  GAS=2.383E+07  ELEC=2.043E+07  HELEC=1.367E+06
OTH =3.658E+05  TOT=6.927E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.301E+00  NOX =4.811E+01  SOX =1.615E+00  HC=3.496E-01  CO=5.873E+00
ALD =6.285E-01  DACD=7.231E-05  HMET=3.828E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   34837.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.021E-03  TSS=2.023E+00  SFIDE=2.467E-05  FLIDE=7.887E-04
TFE =1.228E-02  DFE=4.702E-03  ZN =1.277E-05  PB   =1.784E-05  MN   =4.082E-03
COD =3.289E+00  CU =0.0        TDS=6.901E+00  BOD  =1.956E+00  HMET =4.956E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.569E+00  NOX  =3.617E-01  SOX=3.866E+00  HC  =1.349E+01  CO =2.635E+01
GFL =1.555E-01  PFL  =1.332E-01  AMM=1.625E-02  HMET=4.201E-02  ALD=1.065E-08
ORG =1.118E+01  SFIDE=6.489E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      653.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.521E-03  CYAN =1.877E-03  O&G =1.421E-02  PHEN=3.289E-04  TSS =7.371E-02
SFIDE=3.385E-04  FLIDE=2.502E-02  TI  =0.0        ZN  =1.460E-03  NITR=1.152E-02
PB   =8.664E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.603E-01  BOD  =1.025E-02  HMET=1.379E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.151 Van - Brayton Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.489E+07  PET=8.389E+06  GAS=2.512E+07  ELEC=2.170E+07  HELEC=1.645E+06
OTH =4.347E+05  TOT=7.219E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.635E+00  NOX =5.099E+01  SOX =1.678E+00  HC=3.767E-01  CO=6.165E+00
ALD =6.498E-01  DACD=9.144E-05  HMET=3.562E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   36833.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.828E-04  TSS=2.098E+00  SFIDE=1.914E-05  FLIDE=8.154E-04
TFE =1.301E-02  DFE=4.892E-03  ZN =1.052E-05  PB   =1.435E-05  MN   =4.324E-03
COD =3.400E+00  CU =0.0        TDS=7.135E+00  BOD  =2.022E+00  HMET =4.892E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.531E+00  NOX  =3.729E-01  SOX=4.012E+00  HC  =1.391E+01  CO =2.793E+01
GFL =1.401E-01  PFL  =1.192E-01  AMM=1.886E-02  HMET=3.463E-02  ALD=1.065E-08
ORG =1.149E+01  SFIDE=6.405E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     666.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.032E-03  CYAN =1.952E-03  O&G =1.504E-02  PHEN=3.459E-04  TSS =7.569E-02
SFIDE=3.583E-04  FLIDE=2.579E-02  TI  =0.0        ZN  =1.539E-03  NITR=1.218E-02
PB   =9.051E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.566E-01  BOD  =1.052E-02  HMET=1.361E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.152 Van - Brayton Engine Energy and Residuals
2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.320E+07  PET=7.824E+06  GAS=2.357E+07  ELEC=2.053E+07  HELEC=1.276E+06
OTH =4.468E+05  TOT=6.670E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.189E+00  NOX =4.677E+01  SOX =1.610E+00  HC=3.364E-01  CO=5.776E+00
ALD =6.299E-01  DACD=6.049E-05  HMET=3.355E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33791.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.117E-04  TSS=2.020E+00  SFIDE=1.683E-05  FLIDE=7.905E-04
TFE =1.194E-02  DFE=4.629E-03  ZN =9.503E-06  PB   =1.280E-05  MN   =3.968E-03
COD =3.296E+00  CU =0.0        TDS=6.917E+00  BOD  =1.960E+00  HMET =4.694E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.943E+00  NOX  =3.609E-01  SOX=3.758E+00  HC  =1.335E+01  CO =2.566E+01
GFL =1.350E-01  PFL  =1.150E-01  AMM=1.471E-02  HMET=3.121E-02  ALD=1.065E-08
ORG =1.112E+01  SFIDE=6.146E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      622.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.281E-03  CYAN =1.849E-03  O&G =1.396E-02  PHEN=3.214E-04  TSS =7.149E-02
SFIDE=3.293E-04  FLIDE=2.392E-02  TI  =0.0        ZN  =1.439E-03  NITR=1.139E-02
PB   =8.464E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.450E-01  BOD  =1.017E-02  HMET=1.306E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.153 Van - Brayton Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.679E+07  PET=7.490E+06  GAS=2.195E+07  ELEC=1.825E+07  HELEC=1.505E+06
OTH =3.349E+05  TOT=6.632E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.845E+00  NOX =5.469E+01  SOX =1.674E+00  HC=4.013E-01  CO=6.394E+00
ALD =6.362E-01  DACD=1.045E-04  HMET=3.288E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   39269.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.249E-03  TSS=2.148E+00  SFIDE=1.435E-05  FLIDE=1.490E-03
TFE =1.610E-02  DFE=9.312E-03  ZN =1.033E-05  PB   =1.299E-05  MN   =4.642E-03
COD =3.328E+00  CU =0.0        TDS=1.224E+01  BOD  =1.982E+00  HMET =3.997E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.793E+00  NOX  =4.086E-01  SOX=4.066E+00  HC  =1.189E+01  CO =2.985E+01
GFL =1.390E-01  PFL  =1.172E-01  AMM=2.082E-02  HMET=2.932E-02  ALD=1.065E-08
ORG =8.987E+00  SFIDE=6.073E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     691.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.448E-01  CYAN =2.537E-02  O&G =3.059E-02  PHEN=3.993E-03  TSS =4.081E-01
SFIDE=3.424E-04  FLIDE=1.010E-01  TI  =0.0        ZN  =1.594E-03  NITR=1.263E-02
PB   =9.336E-05  MN   =0.0        COD =3.052E-02  AL  =1.080E-02  CU  =3.087E-05
TDS  =7.458E-01  BOD  =3.008E-02  HMET=1.290E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.154 Mini-Auto - Stirling Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.620E+06  PET=3.683E+06  GAS=1.321E+07  ELEC=1.279E+07  HELEC=1.124E+06
OTH =1.986E+05  TOT=3.973E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.720E+00  NOX =2.564E+01  SOX =7.916E-01  HC=1.866E-01  CO=3.010E+00
ALD =3.016E-01  DACD=4.450E-05  HMET=2.395E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    18562.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.874E-04  TSS=9.838E-01  SFIDE=1.407E-05  FLIDE=3.783E-04
TFE =6.543E-03  DFE=2.470E-03  ZN =6.988E-06  PB   =9.930E-06  MN   =2.177E-03
COD =1.578E+00  CU =0.0        TDS=3.310E+00  BOD  =9.413E-01  HMET =3.301E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.121E+00  NOX  =1.737E-01  SOX=1.976E+00  HC  =6.533E+00  CO =1.404E+01
GFL =1.262E-01  PFL  =1.096E-01  AMM=9.347E-03  HMET=2.308E-02  ALD=1.065E-08
ORG =5.329E+00  SFIDE=4.322E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      388.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.546E-03  CYAN =9.858E-04  O&G =7.525E-03  PHEN=1.743E-04  TSS =4.199E-02
SFIDE=1.804E-04  FLIDE=1.458E-02  TI  =0.0        ZN  =7.705E-04  NITR=6.076E-03
PB   =4.566E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.304E-01  BOD  =4.871E-03  HMET=9.172E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.155 Mini-Auto - Stirling Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=8.255E+06  PET=4.433E+06  GAS=1.386E+07  ELEC=1.274E+07  HELEC=1.095E+06
OTH =2.276E+05  TOT=4.062E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.072E+00  NOX =2.758E+01  SOX =8.834E-01  HC=1.962E-01  CO=3.292E+00
ALD =3.398E-01  DACD=3.679E-05  HMET=2.113E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   19910.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.721E-04  TSS=1.102E+00  SFIDE=9.090E-06  FLIDE=4.263E-04
TFE =7.036E-03  DFE=2.724E-03  ZN =5.217E-06  PB   =7.050E-06  MN   =2.341E-03
COD =1.778E+00  CU =0.0        TDS=3.730E+00  BOD  =1.059E+00  HMET =3.110E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.553E+00  NOX  =1.941E-01  SOX=2.124E+00  HC  =7.195E+00  CO =1.514E+01
GFL =9.237E-02  PFL  =7.935E-02  AMM=8.828E-03  HMET=1.713E-02  ALD=1.065E-08
ORG =5.964E+00  SFIDE=4.071E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     379.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.887E-03  CYAN =1.088E-03  O&G =8.221E-03  PHEN=1.894E-04  TSS =4.328E-02
SFIDE=1.943E-04  FLIDE=1.448E-02  TI  =0.0        ZN  =8.472E-04  NITR=6.712E-03
PB   =4.961E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.323E-01  BOD  =5.391E-03  HMET=8.645E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.156 Mini-Auto - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.278E+06  PET=3.669E+06  GAS=1.131E+07  ELEC=1.046E+07  HELEC=7.672E+05
OTH =2.133E+05  TOT=3.259E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.389E+00  NOX =2.234E+01  SOX =7.517E-01  HC=1.603E-01  CO=2.729E+00
ALD =2.926E-01  DACD=2.951E-05  HMET=1.609E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    16118.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.412E-04  TSS=9.415E-01  SFIDE=5.695E-06  FLIDE=3.672E-04
TFE =5.701E-03  DFE=2.208E-03  ZN =3.590E-06  PB   =4.632E-06  MN   =1.896E-03
COD =1.531E+00  CU =0.0        TDS=3.213E+00  BOD  =9.113E-01  HMET =2.449E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.649E+00  NOX  =1.671E-01  SOX=1.757E+00  HC  =6.165E+00  CO =1.226E+01
GFL =8.048E-02  PFL  =6.917E-02  AMM=7.101E-03  HMET=1.170E-02  ALD=1.065E-03
ORG =5.119E+00  SFIDE=3.207E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      311.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.956E-03  CYAN =8.815E-04  O&G =6.661E-03  PHEN=1.534E-04  TSS =3.506E-02
SFIDE=1.573E-04  FLIDE=1.189E-02  TI  =0.0        ZN  =6.853E-04  NITR=5.437E-03
PB   =4.005E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.098E-01  BOD  =4.669E-03  HMET=6.813E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.157 Small Auto - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.581E+06  PET=4.104E+06  GAS=1.469E+07  ELEC=1.422E+07  HELEC=1.247E+06
OTH =2.210E+05  TOT=4.417E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.145E+00  NOX =2.854E+01  SOX =8.828E-01  HC=2.076E-01  CO=3.353E+00
ALD =3.365E-01  DACD=4.934E-05  HMET=2.652E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    20661.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.491E-04  TSS=1.097E+00  SFIDE=1.547E-05  FLIDE=4.221E-04
TFE =7.283E-03  DFE=2.751E-03  ZN =7.710E-06  PB   =1.094E-05  MN   =2.423E-03
COD =1.760E+00  CU =0.0        TDS=3.694E+00  BOD  =1.050E+00  HMET =3.662E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.801E+00  NOX  =1.938E-01  SOX=2.200E+00  HC  =7.285E+00  CO =1.563E+01
GFL =1.400E-01  PFL  =1.215E-01  AMM=1.038E-02  HMET=2.545E-02  ALD=1.065E-08
ORG =5.945E+00  SFIDE=4.794E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      431.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.060E-03  CYAN =1.098E-03  O&G =8.378E-03  PHEN=1.941E-04  TSS =4.669E-02
SFIDE=2.008E-04  FLIDE=1.621E-02  TI  =0.0        ZN  =8.578E-04  NITR=6.766E-03
PB   =5.082E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.450E-01  BOD  =5.433E-03  HMET=1.017E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.158 Small Auto - Stirling Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.155E+06  PET=4.927E+06  GAS=1.539E+07  ELEC=1.413E+07  HELEC=1.213E+06
OTH =2.526E+05  TOT=4.508E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.523E+00  NOX =3.060E+01  SOX =9.823E-01  HC=2.177E-01  CO=3.657E+00
ALD =3.780E-01  DACD=4.068E-05  HMET=2.331E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    22090.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=5.192E-04  TSS=1.225E+00  SFIDE=9.900E-06  FLIDE=4.743E-04
TFE =7.807E-03  DFE=3.023E-03  ZN =5.719E-06  PB   =7.709E-06  MN   =2.598E-03
COD =1.978E+00  CU =0.0        TDS=4.150E+00  BOD  =1.178E+00  HMET =3.439E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.157E+00  NOX  =2.160E-01  SOX=2.358E+00  HC  =8.002E+00  CO =1.680E+01
SFL =1.023E-01  PFL  =8.786E-02  AMM=9.779E-03  HMET=1.877E-02  ALD=1.065E-08
ORG =6.634E+00  SFIDE=4.502E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      420.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.422E-03  CYAN =1.207E-03  O&G =9.123E-03  PHEN=2.102E-04  TSS =4.798E-02
SFIDE=2.156E-04  FLIDE=1.607E-02  TI  =0.0        ZN  =9.400E-04  NITR=7.448E-03
PB   =5.503E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.468E-01  BOD  =5.997E-03  HMET=9.561E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.159 Small Auto - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.961E+06  PET=4.081E+06  GAS=1.255E+07  ELEC=1.158E+07  HELEC=8.464E+05
OTH =2.369E+05  TOT=3.614E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.770E+00  NOX =2.481E+01  SOX =8.371E-01  HC=1.780E-01  CO=3.036E+00
ALD =3.261E-01  OACD=3.255E-05  HMET=1.770E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    17904.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.727E-04  TSS=1.049E+00  SFIDE=6.077E-06  FLIDE=4.092E-04
TFE =6.333E-03  DFE=2.454E-03  ZN =3.897E-06  PB   =4.995E-06  MN   =2.106E-03
COD =1.706E+00  CU =0.0        TDS=3.581E+00  BOD  =1.015E+00  HMET =2.704E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.150E+00  NOX  =1.861E-01  SOX=1.953E+00  HC  =6.865E+00  CO =1.362E+01
GFL =8.881E-02  PFL  =7.631E-02  AMM=7.863E-03  HMET=1.268E-02  ALD=1.065E-08
ORG =5.702E+00  SFIDE=3.540E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      345.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.395E-03  CYAN =9.798E-04  O&G =7.401E-03  PHEN=1.705E-04  TSS =3.888E-02
SFIDE=1.748E-04  FLIDE=1.319E-02  TI  =0.0        ZN  =7.614E-04  NITR=6.042E-03
PB   =4.449E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.217E-01  BOD  =5.201E-03  HMET=7.521E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.160 Medium Auto - Stirling Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.219E+07  PET=5.326E+06  GAS=1.878E+07  ELEC=1.806E+07  HELEC=1.559E+06
OTH =2.834E+05  TOT=5.636E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.371E+00  NOX =3.673E+01  SOX =1.152E+00  HC=2.669E-01  CO=4.342E+00
ALD =4.405E-01  DACD=6.165E-05  HMET=3.282E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    26574.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.900E-04  TSS=1.433E+00  SFIDE=1.810E-05  FLIDE=5.526E-04
TFE =9.372E-03  DFE=3.551E-03  ZN =9.262E-06  PB   =1.300E-05  MN   =3.117E-03
COD =2.304E+00  CU =0.0        TDS=4.835E+00  BOD  =1.374E+00  HMET =4.590E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.633E+00  NOX  =2.533E-01  SOX=2.840E+00  HC  =9.492E+00  CO =2.011E+01
GFL =1.751E-01  PFL  =1.519E-01  AMM=1.315E-02  HMET=3.050E-02  ALD=1.065E-08
ORG =7.768E+00  SFIDE=6.010E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      550.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.510E-03  CYAN =1.417E-03  O&G  =1.080E-02  PHEN=2.501E-04  TSS =5.964E-0
2
SFIDE=2.584E-04  FLIDE=2.072E-02  TI  =0.0        ZN  =1.105E-03  NITR=8.725E-03
PB   =6.535E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.852E-01  BOD  =7.097E-03  HMET=1.276E-02  MO  =0.0        ARS=0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.161 Medium Auto - Stirling Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.201E+07  PET=6.559E+06  GAS=2.034E+07  ELEC=1.854E+07  HELEC=1.575E+06
OTH =3.337E+05  TOT=5.938E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.997E+00  NOX =4.027E+01  SOX =1.311E+00  HC=2.867E-01  CO=4.844E+00
ALD =5.062E-01  OACD=5.237E-05  HMET=2.959E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    29066.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.442E-04  TSS=1.637E+00  SFIDE=1.147E-05  FLIDE=6.351E-04
TFE =1.028E-02  DFE=3.986E-03  ZN =6.951E-06  PB   =9.194E-06  MN   =3.419E-03
COD =2.648E+00  CU =0.0        TDS=5.557E+00  BOD  =1.577E+00  HMET =4.430E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.066E+00  NOX  =2.889E-01  SOX=3.117E+00  HC  =1.068E+01  CO =2.211E+01
GFL =1.329E-01  PFL  =1.141E-01  AMM=1.273E-02  HMET=2.273E-02  ALD=1.065E-08
ORG =8.870E+00  SFIDE=5.799E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      551.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.136E-03  CYAN =1.592E-03  O&G =1.202E-02  PHEN=2.768E-04  TSS =6.286E-02
SFIDE=2.838E-04  FLIDE=2.110E-02  TI  =0.0        ZN  =1.238E-03  NITR=9.814E-03
PB   =7.236E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.928E-01  BOD  =8.026E-03  HMET=1.232E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.162 Medium Auto - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.266E+06  PET=5.472E+06  GAS=1.673E+07  ELEC=1.539E+07  HELEC=1.113E+06
OTH =3.166E+05  TOT=4.814E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.056E+00  NOX =3.318E+01  SOX =1.126E+00  HC=2.379E-01  CO=4.070E+00
ALD =4.391E-01  DACD=4.280E-05  HMET=2.309E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   23933.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.798E-04  TSS=1.411E+00  SFIDE=7.352E-06  FLIDE=5.511E-04
TFE =8.468E-03  DFE=3.285E-03  ZN =4.926E-06  PB   =6.213E-06  MN   =2.815E-03
COD =2.298E+00  CU =0.0        TDS=4.822E+00  BOD  =1.367E+00  HMET =3.563E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.841E+00  NOX  =2.505E-01  SOX=2.615E+00  HC  =9.228E+00  CO =1.821E+01
GFL =1.169E-01  PFL  =1.004E-01  AMM=1.043E-02  HMET=1.599E-02  ALD=1.065E-08
ORG =7.674E+00  SFIDE=4.665E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     460.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.876E-03  CYAN =1.312E-03  O&G =9.901E-03  PHEN=2.280E-04  TSS =5.180E-02
SFIDE=2.337E-04  FLIDE=1.758E-02  TI  =0.0        ZN  =1.018E-03  NITR=8.085E-03
PB   =5.945E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.622E-01  BOD  =6.998E-03  HMET=9.911E-03  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.163 Large Auto - Stirling Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.453E+07  PET=6.442E+06  GAS=2.247E+07  ELEC=2.150E+07  HELEC=1.832E+06
OTH =3.398E+05  TOT=6.729E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.490E+00  NOX =4.414E+01  SOX =1.398E+00  HC=3.205E-01  CO=5.243E+00
ALD =5.364E-01  OACD=7.241E-05  HMET=3.825E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31929.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.077E-04  TSS=1.742E+00  SFIDE=2.010E-05  FLIDE=6.729E-04
TFE =1.126E-02  DFE=4.278E-03  ZN =1.053E-05  PB   =1.462E-05  MN   =3.747E-03
COD =2.806E+00  CU =0.0        TDS=5.888E+00  BOD  =1.673E+00  HMET =5.405E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.027E+01  NOX  =3.080E-01  SOX=3.421E+00  HC  =1.152E+01  CO =2.417E+01
GFL =2.059E-01  PFL  =1.785E-01  AMM=1.562E-02  HMET=3.458E-02  ALD=1.065E-08
ORG =9.446E+00  SFIDE=7.077E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      657.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.824E-03  CYAN =1.707E-03  O&G =1.299E-02  PHEN=3.008E-04  TSS =7.128E-02
SFIDE=3.106E-04  FLIDE=2.478E-02  TI  =0.0        ZN  =1.330E-03  NITR=1.051E-02
PB   =7.851E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.214E-01  BOD  =8.628E-03  HMET=1.502E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.164 Large Auto - Stirling Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.409E+07  PET=7.722E+06  GAS=2.391E+07  ELEC=2.174E+07  HELEC=1.842E+06
OTH =3.921E+05  TOT=6.971E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.052E+00  NOX =4.728E+01  SOX =1.544E+00  HC=3.366E-01  CO=5.696E+00
ALD =5.968E-01  DACD=6.112E-05  HMET=3.441E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34118.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.445E-04  TSS=1.929E+00  SFIDE=1.300E-05  FLIDE=7.488E-04
TFE =1.206E-02  DFE=4.681E-03  ZN =7.988E-06  PB   =1.051E-05  MN   =4.014E-03
COD =3.122E+00  CU =0.0        TDS=6.552E+00  BOD  =1.859E+00  HMET =5.171E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.457E+00  NOX  =3.405E-01  SOX=3.663E+00  HC  =1.258E+01  CO =2.595E+01
GFL =1.555E-01  PFL  =1.335E-01  AMM=1.491E-02  HMET=2.609E-02  ALD=1.065E-08
ORG =1.045E+01  SFIDE=6.770E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     646.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.377E-03  CYAN =1.869E-03  O&G =1.411E-02  PHEN=3.250E-04  TSS =7.371E-02
SFIDE=3.331E-04  FLIDE=2.475E-02  TI  =0.0        ZN  =1.453E-03  NITR=1.152E-02
PB   =8.492E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.262E-01  BOD  =9.462E-03  HMET=1.438E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B-165 Large Auto - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.203E+07  PET=7.159E+06  GAS=2.175E+07  ELEC=1.994E+07  HELEC=1.427E+06
OTH =4.127E+05  TOT=6.253E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.616E+00  NOX =4.327E+01  SOX =1.477E+00  HC=3.101E-01  CO=5.324E+00
ALD =5.771E-01  DACD=5.485E-05  HMET=2.936E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   31210.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.980E-04  TSS=1.853E+00  SFIDE=8.542E-06  FLIDE=7.242E-04
TFE =1.105E-02  DFE=4.291E-03  ZN =6.040E-06  PB   =7.473E-06  MN   =3.672E-03
COD =3.020E+00  CU =0.0        TDS=6.337E+00  BOD  =1.796E+00  HMET =4.576E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.863E+00  NOX  =3.289E-01  SOX=3.416E+00  HC  =1.210E+01  CO =2.375E+01
GFL =1.499E-01  PFL  =1.286E-01  AMM=1.349E-02  HMET=1.954E-02  ALD=1.065E-08
ORG =1.008E+01  SFIDE=5.991E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     597.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.663E-03  CYAN =1.713E-03  O&G =1.292E-02  PHEN=2.976E-04  TSS =6.730E-02
SFIDE=3.048E-04  FLIDE=2.286E-02  TI  =0.0        ZN  =1.329E-03  NITR=1.055E-02
PB   =7.749E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.107E-01  BOD  =9.188E-03  HMET=1.273E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B-166 Van - Stirling Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.777E+07  PET=7.843E+06  GAS=2.745E+07  ELEC=2.631E+07  HELEC=2.250E+06
OTH =4.148E+05  TOT=8.226E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.903E+00  NOX =5.385E+01  SOX =1.700E+00  HC=3.910E-01  CO=6.387E+00
ALD =6.516E-01  DACD=8.898E-05  HMET=4.712E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38954.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.123E-03  TSS=2.118E+00  SFIDE=2.516E-05  FLIDE=8.175E-04
TFE =1.374E-02  DFE=5.215E-03  ZN =1.307E-05  PB   =1.822E-05  MN   =4.571E-03
COD =3.409E+00  CU =0.0        TDS=7.153E+00  BOD  =2.033E+00  HMET =6.637E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.257E+01  NOX  =3.743E-01  SOX=4.170E+00  HC  =1.401E+01  CO =2.949E+01
GFL =2.530E-01  PFL  =2.193E-01  AMM=1.912E-02  HMET=4.298E-02  ALD=1.065E-08
ORG =1.148E+01  SFIDE=8.689E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      803.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.544E-03  CYAN =2.081E-03  O&G =1.584E-02  PHEN=3.669E-04  TSS =8.711E-02
SFIDE=3.789E-04  FLIDE=3.027E-02  TI  =0.0        ZN  =1.622E-03  NITR=1.281E-02
PB   =9.578E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.705E-01  BOD  =1.049E-02  HMET=1.845E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.167 Van - Stirling Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.640E+07  PET=8.706E+06  GAS=2.738E+07  ELEC=2.533E+07  HELEC=2.195E+06
OTH =4.499E+05  TOT=8.048E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.024E+00  NOX =5.467E+01  SOX =1.732E+00  HC=3.889E-01  CO=6.493E+00
ALD =6.641E-01  DACD=7.426E-05  HMET=4.310E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   39484.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.797E-04  TSS=2.157E+00  SFIDE=1.975E-05  FLIDE=8.331E-04
TFE =1.395E-02  DFE=5.392E-03  ZN =1.098E-05  PB   =1.504E-05  MN   =4.642E-03
COD =3.474E+00  CU =0.0        TDS=7.290E+00  BOD  =2.070E+00  HMET =6.272E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.105E+01  NOX  =3.797E-01  SOX=4.196E+00  HC  =1.410E+01  CO =3.001E+01
GFL =1.850E-01  PFL  =1.591E-01  AMM=1.765E-02  HMET=3.615E-02  ALD=1.065E-08
ORG =1.167E+01  SFIDE=8.212E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     753.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.690E-03  CYAN =2.153E-03  O&G =1.629E-02  PHEN=3.753E-04  TSS =8.613E-02
SFIDE=3.852E-04  FLIDE=2.877E-02  TI  =0.0        ZN  =1.679E-03  NITR=1.329E-02
PB   =9.844E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.628E-01  BOD  =1.054E-02  HMET=1.744E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.168 Van - Stirling Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.434E+07  PET=8.197E+06  GAS=2.574E+07  ELEC=2.403E+07  HELEC=1.818E+06
OTH =4.818E+05  TOT=7.436E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.567E+00  NOX =5.035E+01  SOX =1.663E+00  HC=3.618E-01  CO=6.099E+00
ALD =6.446E-01  DACD=6.995E-05  HMET=3.898E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36360.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=9.628E-04  TSS=2.080E+00  SFIDE=1.653E-05  FLIDE=8.088E-04
TFE =1.285E-02  DFE=4.956E-03  ZN =9.451E-06  PB   =1.267E-05  MN   =4.274E-03
COD =3.373E+00  CU =0.0        TDS=7.077E+00  BOD  =2.008E+00  HMET =5.773E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.070E+01  NOX  =3.687E-01  SOX=3.945E+00  HC  =1.366E+01  CO =2.763E+01
GFL =1.903E-01  PFL  =1.639E-01  AMM=1.640E-02  HMET=3.101E-02  ALD=1.065E-08
ORG =1.130E+01  SFIDE=7.559E-01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      711.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.921E-03  CYAN =1.979E-03  O&G =1.499E-02  PHEN=3.453E-04  TSS =7.995E-02
SFIDE=3.546E-04  FLIDE=2.705E-02  TI  =0.0        ZN  =1.543E-03  NITR=1.223E-02
PB   =9.046E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.503E-01  BOD  =1.031E-02  HMET=1.605E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.169 Mini-Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.212E+07  PET=4.710E+06  GAS=1.322E+07  ELEC=1.337E+07  HELEC=8.614E+05
OTH =4.607E+05  TOT=4.502E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.027E+00  NOX =3.260E+01  SOX =9.283E-01  HC=2.633E-01  CO=3.692E+00
ALD =3.458E-01  DACD=1.141E-04  HMET=2.048E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    25310.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.215E-02  TSS=1.204E+00  SFIDE=2.578E-04  FLIDE=8.194E-04
TFE =9.601E-03  DFE=5.551E-03  ZN =1.136E-04  PB   =1.763E-04  MN   =2.760E-03
COD =1.808E+00  CU =0.0        TDS=6.957E+00  BOD  =1.133E+00  HMET =4.090E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.337E+00  NOX  =2.305E-01  SOX=3.552E+00  HC  =7.136E+00  CO =1.770E+01
GFL =7.492E-02  PFL  =1.965E-02  AMM=1.810E-02  HMET=3.415E-01  ALD=1.065E-08
ORG =5.005E+00  SFIDE=2.575E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      499.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.640E-02  CYAN =1.510E-02  O&G =1.778E-02  PHEN=2.359E-03  TSS =3.523E-01
SFIDE=1.800E-04  FLIDE=5.689E-02  TI  =0.0        ZN  =1.051E-03  NITR=7.091E-03
PB   =8.280E-05  MN   =0.0        COD =2.539E-02  AL  =1.311E-02  CU  =3.745E-05
TDS  =9.259E-01  BOD  =1.801E-02  HMET=5.450E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.904E+05  PET=3.016E+05  GAS=9.716E+05  ELEC=1.175E+06  HELEC=0.0
OTH =2.146E+05  TOT=3.254E+06
```

Table B.170 Mini-Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.200E+07  PET=5.066E+06  GAS=1.535E+07  ELEC=1.376E+07  HELEC=8.291E+05
OTH =2.470E+05  TOT=4.805E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.482E+00  NOX =3.373E+01  SOX =1.024E+00  HC=2.577E-01  CO=3.929E+00
ALD =3.882E-01  DACD=8.476E-05  HMET=1.082E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    24132.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.364E-03  TSS=1.317E+00  SFIDE=0.0        FLIDE=9.089E-04
TFE =9.931E-03  DFE=5.743E-03  ZN =2.240E-06  PB   =1.733E-06  MN   =2.860E-03
COD =2.030E+00  CU =0.0        TDS=7.989E+00  BOD  =1.271E+00  HMET =4.483E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.620E+00  NOX  =2.609E-01  SOX=7.063E+00  HC  =8.215E+00  CO =1.839E+01
GFL =7.246E-02  PFL  =1.197E-02  AMM=1.506E-02  HMET=2.513E-01  ALD=1.065E-08
ORG =5.388E+00  SFIDE=1.772E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      452.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.934E-02  CYAN =1.564E-02  O&G =1.930E-02  PHEN=2.458E-03  TSS =4.304E-01
SFIDE=2.017E-04  FLIDE=5.646E-02  TI  =0.0        ZN  =9.670E-04  NITR=7.710E-03
PB   =5.576E-05  MN   =0.0        COD =2.585E-02  AL  =1.262E-02  CU  =3.605E-05
TDS  =5.504E-01  BOD  =2.120E-02  HMET=5.719E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.505E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.347E+06  PET=4.683E+05  GAS=2.463E+06  ELEC=1.750E+06  HELEC=0.0
OTH =9.112E+03  TOT=6.654E+06
```

Table B.171 Mini-Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.743E+06  PET=4.220E+06  GAS=1.283E+07  ELEC=1.275E+07  HELEC=8.129E+05
OTH =3.559E+05  TOT=4.093E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.291E+00  NOX =2.661E+01  SOX =8.790E-01  HC=2.053E-01  CO=3.223E+00
ALD =3.407E-01  DACD=6.411E-05  HMET=1.224E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   20464.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.523E-03  TSS=1.108E+00  SFIDE=1.696E-04  FLIDE=4.323E-04
TFE =6.790E-03  DFE=2.452E-03  ZN =6.686E-05  PB   =1.053E-04  MN   =2.253E-03
COD =1.783E+00  CU =0.0        TDS=3.743E+00  BOD  =1.085E+00  HMET =1.040E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.869E+00  NOX  =2.000E-01  SOX=2.868E+00  HC  =7.583E+00  CO =1.451E+01
GFL =9.240E-02  PFL  =8.477E-03  AMM=1.163E-02  HMET=2.264E-01  ALD=1.065E-08
ORG =6.051E+00  SFIDE=1.362E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     420.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.710E-03  CYAN =9.772E-04  O&G =7.662E-03  PHEN=1.775E-04  TSS =7.169E-02
SFIDE=1.863E-04  FLIDE=1.391E-02  TI  =0.0        ZN  =8.663E-04  NITR=6.099E-03
PB   =6.508E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =4.375E-01  BOD  =5.776E-03  HMET=2.884E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.278E+05  PET=1.840E+05  GAS=5.743E+05  ELEC=7.989E+05  HELEC=0.0
OTH =1.412E+05  TOT=2.135E+06
```

Table B.172 Mini-Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.121E+07  PET=4.574E+06  GAS=1.482E+07  ELEC=1.411E+07  HELEC=8.420E+05
OTH =2.323E+05  TOT=4.660E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.731E+00  NOX =2.750E+01  SOX =9.028E-01  HC=2.134E-01  CO=3.321E+00
ALD =3.493E-01  DACD=6.920E-05  HMET=9.764E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19801.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.248E-03  TSS=1.131E+00  SFIDE=0.0        FLIDE=4.383E-04
TFE =7.020E-03  DFE=2.517E-03  ZN =1.789E-06  PB   =1.438E-06  MN   =2.330E-03
COD =1.828E+00  CU =0.0        TDS=3.835E+00  BOD  =1.142E+00  HMET =1.780E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.424E+00  NOX  =2.110E-01  SOX=6.501E+00  HC  =8.354E+00  CO =1.499E+01
GFL =9.566E-02  PFL  =9.524E-03  AMM=1.235E-02  HMET=2.391E-01  ALD=1.065E-08
ORG =6.063E+00  SFIDE=1.550E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      407.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.871E-03  CYAN =1.003E-03  O&G =7.903E-03  PHEN=1.830E-04  TSS =1.722E-01
SFIDE=1.925E-04  FLIDE=1.438E-02  TI  =0.0        ZN  =7.870E-04  NITR=6.273E-03
PB   =4.556E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.713E-01  BOD  =6.432E-03  HMET=5.157E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.243E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.441E+06  PET=4.146E+05  GAS=2.196E+06  ELEC=1.703E+06  HELEC=0.0
OTH =8.861E+03  TOT=6.352E+06
```

Table B.173 Mini-Auto, Li/S EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.055E+07  PET=4.231E+06  GAS=1.390E+07  ELEC=1.465E+07  HELEC=1.207E+06
OTH =2.459E+05  TOT=4.904E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.551E+00  NOX =3.035E+01  SOX =9.134E-01  HC=2.366E-01  CO=3.523E+00
ALD =3.456E-01  DACD=8.530E-05  HMET=5.762E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    21970.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.614E-04  TSS=1.164E+00  SFIDE=1.452E-04  FLIDE=1.935E-03
TFE =7.744E-03  DFE=2.727E-03  ZN =1.834E-06  PB   =1.507E-06  MN   =2.572E-03
COD =1.808E+00  CU =2.616E-07  TDS=3.795E+00  BOD  =1.102E+00  HMET =1.101E-04
ARS =2.420E-07  CD =2.616E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.111E+00  NOX  =1.968E-01  SOX=2.219E+00  HC  =7.395E+00  CO =1.653E+01
GFL =1.359E-01  PFL  =4.590E-02  AMM=3.328E-01  HMET=5.252E-03  ALD=1.065E-08
ORG =5.997E+00  SFIDE=1.441E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      453.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.380E-03  CYAN =1.086E-03  O&G =8.654E-03  PHEN=2.006E-04  TSS =9.940E-02
SFIDE=2.124E-04  FLIDE=1.672E-02  TI  =2.551E-05  ZN  =8.681E-04  NITR=6.832E-03
PB   =4.960E-05  MN   =7.390E-06  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.495E-01  BOD  =5.533E-03  HMET=3.052E-02  MO  =1.753E-04  ARS =7.390E-07
NI   =7.194E-06  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=9.797E+05  PET=1.261E+05  GAS=1.435E+06  ELEC=2.442E+06  HELEC=3.778E+05
OTH =2.637E+04  TOT=9.423E+06
```

Table B.174 Mini-Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.077E+07  PET=4.942E+06  GAS=1.413E+07  ELEC=1.399E+07  HELEC=9.676E+05
OTH =4.789E+05  TOT=4.550E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.363E+00  NOX =2.686E+01  SOX =8.238E-01  HC=2.204E-01  CO=3.144E+00
ALD =3.133E-01  OACD=9.501E-05  HMET=1.918E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    21147.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.473E-03  TSS=1.036E+00  SFIDE=2.370E-04  FLIDE=3.997E-04
TPE =6.854E-03  DFE=2.291E-03  ZN =9.248E-05  PB   =1.464E-04  MN   =2.272E-03
COD =1.639E+00  CU =0.0        TDS=3.442E+00  BOD  =1.028E+00  HMET =1.880E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.823E+00  NOX  =1.871E-01  SOX=3.141E+00  HC  =7.282E+00  CO =1.461E+01
GFL =8.228E-02  PFL  =1.379E-02  AMM=1.508E-02  HMET=3.137E-01  ALD=1.065E-08
ORG =5.628E+00  SFIDE=2.461E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      446.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.758E-03  CYAN =9.111E-04  O&G =7.598E-03  PHEN=1.739E-04  TSS =1.048E-01
SFIDE=1.871E-04  FLIDE=1.365E-02  TI  =0.0        ZN  =8.899E-04  NITR=5.970E-03
PB   =7.220E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =5.714E-01  BOD  =5.496E-03  HMET=5.209E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.671E+05  PET=2.971E+05  GAS=9.455E+05  ELEC=1.096E+06  HELEC=0.0
OTH =2.010E+05  TOT=3.007E+06
```

Table B.175 Mini-Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.058E+07  PET=5.285E+06  GAS=1.642E+07  ELEC=1.471E+07  HELEC=9.899E+05
OTH =2.722E+05  TOT=4.897E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.762E+00  NOX =2.774E+01  SOX =9.098E-01  HC=2.155E-01  CO=3.349E+00
ALD =3.519E-01  DACD=7.018E-05  HMET=1.014E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    19964.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.272E-03  TSS=1.140E+00  SFIDE=0.0        FLIDE=4.416E-04
TFE =7.083E-03  DFE=2.537E-03  ZN =1.667E-06  PB   =1.340E-06  MN   =2.350E-03
COD =1.841E+00  CU =0.0        TDS=3.864E+00  BOD  =1.152E+00  HMET =1.861E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.164E+00  NOX  =2.121E-01  SOX=6.363E+00  HC  =8.375E+00  CO =1.515E+01
GFL =8.414E-02  PFL  =8.395E-03  AMM=1.250E-02  HMET=2.307E-01  ALD=1.065E-08
ORG =6.109E+00  SFIDE=1.684E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      402.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.914E-03  CYAN =1.011E-03  O&G =8.048E-03  PHEN=1.846E-04  TSS =1.731E-01
SFIDE=1.942E-04  FLIDE=1.418E-02  TI  =0.0        ZN  =8.069E-04  NITR=6.434E-03
PB   =4.659E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.740E-01  BOD  =6.442E-03  HMET=5.374E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.060E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=9.785E+05  PET=4.470E+05  GAS=2.449E+06  ELEC=1.744E+06  HELEC=0.0
OTH =6.142E+03  TOT=6.200E+06
```

Table B.176 Mini-Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=7.425E+06  PET=3.973E+06  GAS=1.141E+07  ELEC=1.105E+07  HELEC=6.609E+05
OTH =3.652E+05  TOT=3.489E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.701E+00  NOX =2.277E+01  SOX =7.604E-01  HC=1.739E-01  CO=2.772E+00
ALD =2.955E-01  DACD=5.079E-05  HMET=1.075E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    17541.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.991E-03  TSS=9.596E-01  SFIDE=1.504E-04  FLIDE=3.751E-04
TPE =5.809E-03  DFE=2.123E-03  ZN =5.912E-05  PB   =9.324E-05  MN   =1.928E-03
COD =1.546E+00  CU =0.0        TDS=3.246E+00  BOD  =9.415E-01  HMET =9.047E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.838E+00  NOX  =1.736E-01  SOX=2.488E+00  HC  =6.572E+00  CO =1.244E+01
GFL =6.989E-02  PFL  =6.405E-03  AMM=9.501E-03  HMET=2.004E-01  ALD=1.065E-08
ORG =5.251E+00  SFIDE=1.184E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      356.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.030E-03  CYAN =8.462E-04  O&G =6.645E-03  PHEN=1.526E-04  TSS =6.214E-02
SFIDE=1.595E-04  FLIDE=1.168E-02  TI  =0.0        ZN  =7.596E-04  NITR=5.341E-03
PB   =5.712E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.856E-01  BOD  =5.017E-03  HMET=2.509E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.047E+05  PET=1.799E+05  GAS=5.873E+05  ELEC=7.070E+05  HELEC=0.0
OTH =1.289E+05  TOT=1.909E+06
```

Table B.177 Mini-Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.430E+06  PET=4.312E+06  GAS=1.324E+07  ELEC=1.234E+07  HELEC=6.829E+05
OTH =2.506E+05  TOT=3.980E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.078E+00  NOX =2.346E+01  SOX =7.788E-01  HC=1.802E-01  CO=2.848E+00
ALD =3.022E-01  DACD=5.469E-05  HMET=8.539E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   16880.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.087E-03  TSS=9.772E-01  SFIDE=0.0        FLIDE=3.792E-04
TFE =5.988E-03  DFE=2.173E-03  ZN =1.431E-06  PB   =1.150E-06  MN   =1.987E-03
COD =1.581E+00  CU =0.0        TDS=3.318E+00  BOD  =9.884E-01  HMET =1.558E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.305E+00  NOX  =1.829E-01  SOX=5.708E+00  HC  =7.236E+00  CO =1.282E+01
GFL =7.218E-02  PFL  =7.184E-03  AMM=1.005E-02  HMET=2.119E-01  ALD=1.065E-08
DRG =5.246E+00  SFIDE=1.347E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      342.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.154E-03  CYAN =8.664E-04  O&G =6.837E-03  PHEN=1.569E-04  TSS =1.511E-01
SFIDE=1.644E-04  FLIDE=1.204E-02  TI  =0.0        ZN  =6.877E-04  NITR=5.483E-03
PB   =3.972E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.492E-01  BOD  =5.585E-03  HMET=4.517E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =4.655E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=9.976E+05  PET=4.075E+05  GAS=2.114E+06  ELEC=1.648E+06  HELEC=0.0
OTH =5.177E+03  TOT=5.691E+06
```

Table B.178 Mini-Auto, Li/S EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.102E+06  PET=4.005E+06  GAS=1.217E+07  ELEC=1.253E+07  HELEC=9.863E+05
OTH =2.676E+05  TOT=4.173E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.912E+00  NOX =2.591E+01  SOX =7.879E-01  HC=1.996E-01  CO=3.021E+00
ALD =2.990E-01  DACD=6.770E-05  HMET=4.987E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    18746.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.663E-04  TSS=1.005E+00  SFIDE=1.288E-04  FLIDE=1.707E-03
TFE =6.609E-03  DFE=2.359E-03  ZN =1.473E-06  PB   =1.213E-06  MN   =2.196E-03
COD =1.564E+00  CU =2.320E-07  TDS=3.283E+00  BOD  =9.535E-01  HMET =9.550E-05
ARS =2.146E-07  CD =2.320E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.799E+00  NOX  =1.703E-01  SOX=1.903E+00  HC  =6.382E+00  CO =1.415E+01
GFL =1.031E-01  PFL  =3.514E-02  AMM=2.941E-01  HMET=4.301E-03  ALD=1.065E-08
DRG =5.188E+00  SFIDE=1.250E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      379.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.591E-03  CYAN =9.398E-04  O&G =7.504E-03  PHEN=1.721E-04  TSS =8.641E-02
SFIDE=1.814E-04  FLIDE=1.396E-02  TI  =2.262E-05  ZN  =7.614E-04  NITR=5.992E-03
PB   =4.340E-05  MN   =6.554E-06  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.299E-01  BOD  =4.788E-03  HMET=2.648E-02  MO  =1.554E-04  ARS =6.554E-07
NI   =6.380E-06  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=8.156E+05  PET=1.552E+05  GAS=1.195E+06  ELEC=2.007E+06  HELEC=3.139E+05
OTH =2.644E+04  TOT=8.157E+06
```

Table B.179 Mini-Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.457E+07  PET=4.754E+06  GAS=1.256E+07  ELEC=1.373E+07  HELEC=7.792E+05
OTH =5.024E+05  TOT=4.723E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.707E+00  NOX =3.931E+01  SOX =1.009E+00  HC=3.304E-01  CO=4.260E+00
ALD =3.637E-01  DACD=1.714E-04  HMET=2.239E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30402.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.132E-02  TSS=1.298E+00  SFIDE=2.852E-04  FLIDE=8.620E-04
TFF =1.159E-02  DFE=6.701E-03  ZN =1.265E-04  PB   =1.957E-04  MN   =3.327E-03
COD =1.900E+00  CU =0.0        TDS=6.158E+00  BOD  =1.191E+00  HMET =3.564E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.806E+00  NOX  =2.163E-01  SOX=3.823E+00  HC  =5.620E+00  CO =2.116E+01
GFL =6.581E-02  PFL  =2.671E-02  AMM=2.560E-02  HMET=3.799E-01  ALD=1.065E-08
ORG =5.273E+00  SFIDE=2.761E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      551.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.043E-01  CYAN =1.822E-02  O&G =1.882E-02  PHEN=2.816E-03  TSS =2.933E-01
SFIDE=2.013E-04  FLIDE=4.970E-02  TI  =0.0        ZN  =1.154E-03  NITR=7.764E-03
PB   =9.180E-05  MN   =0.0        COD =1.619E-02  AL  =5.026E-03  CU  =1.436E-05
TDS  =8.500E-01  BOD  =1.260E-02  HMET=5.843E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=6.276E+05  PET=3.662E+05  GAS=1.181E+06  ELEC=1.422E+06  HELEC=0.0
OTH =2.568E+05  TOT=3.856E+06
```

Table B.180 Mini-Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.534E+07  PET=4.999E+06  GAS=1.447E+07  ELEC=1.428E+07  HELEC=7.990E+05
OTH =2.598E+05  TOT=5.121E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.023E+00  NOX =3.977E+01  SOX =1.015E+00  HC=3.356E-01  CO=4.300E+00
ALD =3.652E-01  DACD=1.769E-04  HMET=1.581E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    28533.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.823E-03  TSS=1.291E+00  SFIDE=0.0        FLIDE=8.540E-04
TFE =1.173E-02  DFE=6.782E-03  ZN =3.087E-06  PB   =2.389E-06  MN   =3.366E-03
COD =1.908E+00  CU =0.0        TDS=6.427E+00  BOD  =1.229E+00  HMET =4.563E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.078E+00  NOX  =2.209E-01  SOX=7.588E+00  HC  =6.107E+00  CO =2.141E+01
GFL =6.736E-02  PFL  =2.799E-02  AMM=2.629E-02  HMET=2.808E-01  ALD=1.065E-08
ORG =5.063E+00  SFIDE=2.933E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      502.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.056E-01  CYAN =1.844E-02  O&G =1.924E-02  PHEN=2.846E-03  TSS =4.130E-01
SFIDE=2.022E-04  FLIDE=5.070E-02  TI  =0.0        ZN  =9.807E-04  NITR=7.811E-03
PB   =5.720E-05  MN   =0.0        COD =1.625E-02  AL  =5.153E-03  CU  =1.472E-05
TDS  =4.058E-01  BOD  =1.400E-02  HMET=8.393E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =6.119E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.161E+06  PET=5.499E+05  GAS=2.951E+06  ELEC=1.786E+06  HELEC=0.0
OTH =1.038E+04  TOT=7.164E+06
```

Table B.181 Mini-Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.285E+07  PET=5.440E+06  GAS=1.559E+07  ELEC=1.425E+07  HELEC=1.147E+06
OTH =4.533E+05  TOT=4.990E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.490E+00  NOX =3.572E+01  SOX =1.064E+00  HC=2.779E-01  CO=4.125E+00
ALD =4.012E-01  DACD=1.008E-04  HMET=1.761E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27634.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.283E-02  TSS=1.380E+00  SFIDE=2.674E-04  FLIDE=9.497E-04
TFE =1.051E-02  DFE=6.080E-03  ZN =1.183E-04  PB   =1.832E-04  MN   =3.026E-03
COD =2.098E+00  CU =0.0        TDS=8.029E+00  BOD  =1.283E+00  HMET =3.752E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.442E+00  NOX  =2.662E-01  SOX=3.873E+00  HC  =8.109E+00  CO =1.939E+01
GFL =1.052E-01  PFL  =1.717E-02  AMM=1.716E-02  HMET=3.553E-01  ALD=1.065E-08
ORG =5.783E+00  SFIDE=1.726E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     548.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.460E-02  CYAN =1.655E-02  O&G =1.969E-02  PHEN=2.598E-03  TSS =3.295E-01
SFIDE=2.084E-04  FLIDE=7.377E-02  TI  =0.0        ZN  =1.147E-03  NITR=7.800E-03
PB   =8.937E-05  MN   =0.0        COD =2.108E-02  AL  =8.237E-03  CU  =2.353E-05
TDS  =9.876E-01  BOD  =2.066E-02  HMET=3.654E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.736E+05  PET=3.294E+05  GAS=1.138E+06  ELEC=1.274E+06  HELEC=0.0
OTH =2.322E+05  TOT=3.548E+06
```

Table B.182 Mini-Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.470E+07  PET=6.098E+06  GAS=1.902E+07  ELEC=1.612E+07  HELEC=1.213E+06
OTH =2.456E+05  TOT=5.854E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.211E+00  NOX =3.737E+01  SOX =1.101E+00  HC=2.935E-01  CO=4.296E+00
ALD =4.141E-01  OACD=1.119E-04  HMET=1.385E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   26762.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.612E-03  TSS=1.415E+00  SFIDE=0.0        FLIDE=9.694E-04
TFE =1.101E-02  DFE=6.365E-03  ZN =2.628E-06  PB   =2.034E-06  MN   =3.167E-03
COD =2.165E+00  CU =0.0        TDS=8.787E+00  BOD  =1.371E+00  HMET =5.360E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.373E+00  NOX  =2.844E-01  SOX=9.695E+00  HC  =9.305E+00  CO =2.028E+01
GFL =1.111E-01  PFL  =1.998E-02  AMM=1.868E-02  HMET=3.799E-01  ALD=1.065E-08
ORG =5.747E+00  SFIDE=2.041E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      529.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.905E-02  CYAN =1.733E-02  O&G =2.100E-02  PHEN=2.714E-03  TSS =5.071E-01
SFIDE=2.152E-04  FLIDE=7.769E-02  TI  =0.0        ZN  =1.014E-03  NITR=8.078E-03
PB   =5.862E-05  MN   =0.0        COD =2.188E-02  AL  =8.709E-03  CU  =2.488E-05
TDS  =6.311E-01  BOD  =2.406E-02  HMET=7.311E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =8.368E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.704E+06  PET=7.528E+05  GAS=3.949E+06  ELEC=2.475E+06  HELEC=0.0
OTH =1.385E+04  TOT=9.846E+06
```

Table B.183 Small Auto - Pb/Acid EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.345E+07  PET=5.227E+06  GAS=1.467E+07  ELEC=1.485E+07  HELEC=9.554E+05
OTH =5.147E+05  TOT=4.998E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.578E+00  NOX =3.614E+01  SOX =1.029E+00  HC=2.921E-01  CO=4.092E+00
ALD =3.831E-01  DACD=1.267E-04  HMET=2.291E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    28094.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.359E-02  TSS=1.334E+00  SFIDE=2.904E-04  FLIDE=9.081E-04
TFE =1.064E-02  DFE=6.154E-03  ZN =1.279E-04  PB   =1.986E-04  MN   =3.059E-03
COD =2.003E+00  CU =0.0        TDS=7.715E+00  BOD  =1.255E+00  HMET =4.542E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.039E+00  NOX  =2.555E-01  SOX=3.960E+00  HC  =7.919E+00  CO =1.962E+01
GFL =8.309E-02  PFL  =2.184E-02  AMM=2.010E-02  HMET=3.846E-01  ALD=1.065E-08
ORG =5.550E+00  SFIDE=2.862E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      555.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.578E-02  CYAN =1.674E-02  O&G =1.972E-02  PHEN=2.615E-03  TSS =3.909E-01
SFIDE=1.994E-04  FLIDE=6.308E-02  TI  =0.0        ZN  =1.168E-03  NITR=7.859E-03
PB   =9.234E-05  MN   =0.0        COD =2.815E-02  AL  =1.454E-02  CU  =4.154E-05
TDS  =1.035E+00  BOD  =1.999E-02  HMET=6.056E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=6.650E+05  PET=3.398E+05  GAS=1.094E+06  ELEC=1.323E+06  HELEC=0.0
OTH =2.417E+05  TOT=3.665E+06
```

Table B.184 Small Auto - Ni/Zn EV Energy and Residuals
1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.344E+07  PET=5.657E+06  GAS=1.719E+07  ELEC=1.541E+07  HELEC=1.490E+06
OTH =2.755E+05  TOT=5.381E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.123E+00  NOX =3.750E+01  SOX =1.137E+00  HC=2.868E-01  CO=4.366E+00
ALD =4.310E-01  DACD=9.486E-05  HMET=1.231E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    26829.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.270E-03  TSS=1.462E+00  SFIDE=0.0        FLIDE=1.009E-03
TFE =1.104E-02  DFE=6.385E-03  ZN =2.487E-06  PB   =1.925E-06  MN   =3.179E-03
COD =2.254E+00  CU =0.0        TDS=8.903E+00  BOD  =1.413E+00  HMET =5.053E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.410E+00  NOX  =2.904E-01  SOX=8.103E+00  HC  =9.182E+00  CO =2.045E+01
GFL =8.065E-02  PFL  =1.346E-02  AMM=1.682E-02  HMET=2.928E-01  ALD=1.065E-08
OBG =5.983E+00  SFIDE=1.991E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      503.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.933E-02  CYAN =1.739E-02  O&G =2.148E-02  PHEN=2.732E-03  TSS =4.850E-01
SFIDE=2.240E-04  FLIDE=6.281E-02  TI  =0.0        ZN  =1.074E-03  NITR=8.565E-03
PB   =6.194E-05  MN   =0.0        COD =2.875E-02  AL  =1.405E-02  CU  =4.013E-05
TDS  =6.167E-01  BOD  =2.371E-02  HMET=6.509E-02  MO  =2.632E-04  ARS =0.0
NI   =0.0        OTH  =6.420E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.570E+06  PET=5.461E+05  GAS=2.873E+06  ELEC=2.041E+06  HELEC=5.672E+05
OTH =1.063E+04  TOT=7.760E+06
```

Table B.185 Small Auto - Pb/Acid EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.090E+07  PET=4.716E+06  GAS=1.434E+07  ELEC=1.427E+07  HELEC=9.067E+05
OTH =4.060E+05  TOT=4.580E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.798E+00  NOX =2.967E+01  SOX =9.797E-01  HC=2.291E-01  CO=3.594E+00
ALD =3.797E-01  DACD=7.177E-05  HMET=1.412E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22906.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.295E-03  TSS=1.235E+00  SFIDE=2.000E-04  FLIDE=4.821E-04
TFE =7.572E-03  DFE=2.733E-03  ZN =7.872E-05  PB   =1.241E-04  MN   =2.513E-03
COD =1.987E+00  CU =0.0        TDS=4.171E+00  BOD  =1.210E+00  HMET =1.166E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.576E+00  NOX  =2.233E-01  SOX=3.251E+00  HC  =8.479E+00  CO =1.618E+01
GFL =1.031E-01  PFL  =9.524E-03  AMM=1.300E-02  HMET=2.667E-01  ALD=1.065E-08
ORG =6.752E+00  SFIDE=1.527E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     472.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.253E-03  CYAN =1.089E-03  O&G =8.542E-03  PHEN=1.979E-04  TSS =8.028E-02
SFIDE=2.078E-04  FLIDE=1.551E-02  TI  =0.0        ZN  =9.721E-04  NITR=6.798E-03
PB   =7.388E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =5.073E-01  BOD  =6.462E-03  HMET=3.234E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.044E+05  PET=2.169E+05  GAS=6.771E+05  ELEC=9.419E+05  HELEC=0.0
OTH =1.665E+05  TOT=2.517E+06
```

Table B.186 Small Auto - Ni/Zn EV Energy and Residuals
2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.263E+07  PET=5.133E+06  GAS=1.668E+07  ELEC=1.587E+07  HELEC=9.409E+05
OTH =2.602E+05  TOT=5.246E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.315E+00  NOX =3.072E+01  SOX =1.007E+00  HC=2.387E-01  CO=3.708E+00
ALD =3.897E-01  DACD=7.781E-05  HMET=1.120E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22121.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.434E-03  TSS=1.263E+00  SFIDE=0.0        FLIDE=4.890E-04
TFE =7.843E-03  DFE=2.809E-03  ZN =1.995E-06  PB   =1.604E-06  MN   =2.602E-03
COD =2.039E+00  CU =0.0        TDS=4.279E+00  BOD  =1.276E+00  HMET =2.039E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.228E+00  NOX  =2.362E-01  SOX=7.525E+00  HC  =9.384E+00  CO =1.675E+01
GFL =1.069E-01  PFL  =1.077E-02  AMM=1.385E-02  HMET=2.811E-01  ALD=1.065E-08
ORG =6.764E+00  SFIDE=1.751E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      456.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.441E-03  CYAN =1.119E-03  O&G =8.825E-03  PHEN=2.044E-04  TSS =1.986E-01
SFIDE=2.151E-04  FLIDE=1.606E-02  TI  =0.0        ZN  =8.785E-04  NITR=7.002E-03
PB   =5.086E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.934E-01  BOD  =7.232E-03  HMET=5.914E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =6.172E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.696E+06  PET=4.880E+05  GAS=2.585E+06  ELEC=2.004E+06  HELEC=0.0
OTH =1.043E+04  TOT=7.477E+06
```

Table B.187 Small Auto - Li/S EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.185E+07  PET=4.730E+06  GAS=1.560E+07  ELEC=1.650E+07  HELEC=1.370E+06
OTH =2.763E+05  TOT=5.531E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.102E+00  NOX =3.408E+01  SOX =1.020E+00  HC=2.659E-01  CO=3.946E+00
ALD =3.856E-01  DACD=9.665E-05  HMET=6.476E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   24673.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.426E-04  TSS=1.301E+00  SFIDE=1.705E-04  FLIDE=2.247E-03
TFF =8.695E-03  DFE=3.057E-03  ZN =2.050E-06  PB   =1.686E-06  MN   =2.888E-03
COD =2.017E+00  CU =3.072E-07  TDS=4.234E+00  BOD  =1.230E+00  HMET =1.238E-04
ARS =2.842E-07  CD =3.072E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.033E+00  NOX  =2.196E-01  SOX=2.486E+00  HC  =8.259E+00  CO =1.856E+01
GFL =1.541E-01  PFL  =5.346E-02  AMM=3.901E-01  HMET=5.859E-03  ALD=1.065E-08
ORG =6.690E+00  SFIDE=1.620E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      510.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.040E-03  CYAN =1.217E-03  O&G =9.710E-03  PHEN=2.251E-04  TSS =1.128E-01
SFIDE=2.384E-04  FLIDE=1.882E-02  TI  =2.995E-05  ZN  =9.741E-04  NITR=7.661E-03
PB   =5.561E-05  MN   =8.678E-06  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.677E-01  BOD  =6.177E-03  HMET=3.431E-02  MO  =2.058E-04  ARS =8.678E-07
NI   =8.448E-06  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.150E+06  PET=1.481E+05  GAS=1.685E+06  ELEC=2.868E+06  HELEC=4.436E+05
OTH =3.096E+04  TOT=1.107E+07
```

Table B.188 Small Auto - Pb/Acid EV Energy and Residuals
1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.207E+07  PET=5.528E+06  GAS=1.580E+07  ELEC=1.567E+07  HELEC=1.079E+06
OTH =5.466E+05  TOT=5.095E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.881E+00  NOX =2.996E+01  SOX =9.173E-01  HC=2.461E-01  CO=3.504E+00
ALD =3.487E-01  DACD=1.066E-04  HMET=2.204E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    23693.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.553E-03  TSS=1.154E+00  SFIDE=2.785E-04  FLIDE=4.453E-04
TFE =7.643E-03  DFE=2.551E-03  ZN =1.086E-04  PB   =1.719E-04  MN   =2.534E-03
COD =1.824E+00  CU =0.0        TDS=3.831E+00  BOD  =1.145E+00  HMET =2.113E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.534E+00  NOX  =2.088E-01  SOX=3.571E+00  HC  =8.145E+00  CO =1.629E+01
GFL =9.178E-02  PFL  =1.552E-02  AMM=1.689E-02  HMET=3.683E-01  ALD=1.065E-08
DRG =6.275E+00  SFIDE=2.767E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      501.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.306E-03  CYAN =1.014E-03  O&G =8.469E-03  PHEN=1.938E-04  TSS =1.176E-01
SFIDE=2.087E-04  FLIDE=1.522E-02  TI  =0.0        ZN  =1.000E-03  NITR=6.651E-03
PB   =8.221E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =6.627E-01  BOD  =6.151E-03  HMET=5.857E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.489E+05  PET=3.490E+05  GAS=1.111E+06  ELEC=1.287E+06  HELEC=0.0
OTH =2.362E+05  TOT=3.534E+06
```

Table B.189 Small Auto - Ni/Zn EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.191E+07  PET=5.940E+06  GAS=1.851E+07  ELEC=1.657E+07  HELEC=1.108E+06
OTH =3.053E+05  TOT=5.518E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.357E+00  NOX =3.105E+01  SOX =1.018E+00  HC=2.413E-01  CO=3.747E+00
ALD =3.936E-01  DACD=7.892E-05  HMET=1.161E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22346.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.459E-03  TSS=1.275E+00  SFIDE=0.0        FLIDE=4.938E-04
TFE =7.927E-03  DFE=2.838E-03  ZN =1.864E-06  PB   =1.498E-06  MN   =2.630E-03
COD =2.059E+00  CU =0.0        TDS=4.321E+00  BOD  =1.290E+00  HMET =2.127E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.945E+00  NOX  =2.379E-01  SOX=7.361E+00  HC  =9.423E+00  CO =1.696E+01
GFL =9.419E-02  PFL  =9.473E-03  AMM=1.403E-02  HMET=2.709E-01  ALD=1.065E-08
ORG =6.831E+00  SFIDE=1.899E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     451.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.500E-03  CYAN =1.131E-03  O&G =9.006E-03  PHEN=2.065E-04  TSS =1.994E-01
SFIDE=2.174E-04  FLIDE=1.587E-02  TI  =0.0        ZN  =9.027E-04  NITR=7.197E-03
PB   =5.212E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.966E-01  BOD  =7.254E-03  HMET=6.148E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.949E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.150E+06  PET=5.255E+05  GAS=2.879E+06  ELEC=2.050E+06  HELEC=0.0
OTH =7.221E+03  TOT=7.289E+06
```

Table B.190 Small Auto - Pb/Acid EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=8.287E+06  PET=4.430E+06  GAS=1.273E+07  ELEC=1.234E+07  HELEC=7.349E+05
OTH =4.159E+05  TOT=3.895E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.127E+00  NOX =2.531E+01  SOX =8.448E-01  HC=1.935E-01  CO=3.081E+00
ALD =3.282E-01  DACD=5.672E-05  HMET=1.244E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   19589.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.701E-03  TSS=1.067E+00  SFIDE=1.785E-04  FLIDE=4.170E-04
TFE =6.458E-03  DFE=2.358E-03  ZN =7.008E-05  PB   =1.106E-04  MN   =2.144E-03
COD =1.718E+00  CU =0.0        TDS=3.606E+00  BOD  =1.046E+00  HMET =1.013E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.411E+00  NOX  =1.933E-01  SOX=2.821E+00  HC  =7.331E+00  CO =1.383E+01
GFL =7.772E-02  PFL  =7.184E-03  AMM=1.059E-02  HMET=2.376E-01  ALD=1.065E-08
ORG =5.842E+00  SFIDE=1.326E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     399.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.480E-03  CYAN =9.401E-04  O&G =7.386E-03  PHEN=1.696E-04  TSS =6.944E-02
SFIDE=1.773E-04  FLIDE=1.298E-02  TI  =0.0        ZN  =8.509E-04  NITR=5.935E-03
PB   =6.488E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =4.490E-01  BOD  =5.600E-03  HMET=2.808E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.617E+05  PET=2.136E+05  GAS=6.973E+05  ELEC=8.394E+05  HELEC=0.0
OTH =1.530E+05  TOT=2.266E+06
```

Table B.191 Small Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=9.508E+06  PET=4.847E+06  GAS=1.494E+07  ELEC=1.392E+07  HELEC=7.641E+05
OTH =2.810E+05  TOT=4.489E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.589E+00  NOX =2.623E+01  SOX =8.703E-01  HC=2.017E-01  CO=3.184E+00
ALD =3.376E-01  DACD=6.158E-05  HMET=9.821E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   18880.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.253E-03  TSS=1.092E+00  SFIDE=0.0        FLIDE=4.236E-04
TFF =6.697E-03  DFE=2.428E-03  ZN =1.599E-06  PB   =1.285E-06  MN   =2.223E-03
COD =1.766E+00  CU =0.0        TDS=3.706E+00  BOD  =1.106E+00  HMET =1.790E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.983E+00  NOX  =2.050E-01  SOX=6.633E+00  HC  =8.143E+00  CO =1.434E+01
GFL =8.077E-02  PFL  =8.136E-03  AMM=1.129E-02  HMET=2.503E-01  ALD=1.065E-08
ORG =5.860E+00  SFIDE=1.524E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      384.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.646E-03  CYAN =9.680E-04  O&G =7.645E-03  PHEN=1.754E-04  TSS =1.749E-01
SFIDE=1.838E-04  FLIDE=1.346E-02  TI  =0.0        ZN  =7.687E-04  NITR=6.129E-03
PB   =4.440E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.688E-01  BOD  =6.292E-03  HMET=5.195E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.505E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.180E+06  PET=4.819E+05  GAS=2.500E+06  ELEC=1.949E+06  HELEC=0.0
OTH =6.123E+03  TOT=6.730E+06
```

Table B.192 Small Auto, Li/S EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.113E+06  PET=4.483E+06  GAS=1.367E+07  ELEC=1.413E+07  HELEC=1.122E+06
OTH =3.008E+05  TOT=4.715E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.390E+00  NOX =2.912E+01  SOX =8.806E-01  HC=2.246E-01  CO=3.387E+00
ALD =3.337E-01  DACD=7.685E-05  HMET=5.606E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    21077.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.360E-04  TSS=1.125E+00  SFIDE=1.523E-04  FLIDE=1.994E-03
TFE =7.429E-03  DFE=2.647E-03  ZN =1.648E-06  PB   =1.359E-06  MN   =2.468E-03
COD =1.745E+00  CU =2.744E-07  TDS=3.664E+00  BOD  =1.064E+00  HMET =1.074E-04
ARS =2.538E-07  CD =2.744E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.565E+00  NOX  =1.901E-01  SOX=2.133E+00  HC  =7.131E+00  CO =1.590E+01
GFL =1.173E-01  PFL  =4.118E-02  AMM=3.472E-01  HMET=4.800E-03  ALD=1.065E-08
ORG =5.789E+00  SFIDE=1.406E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      427.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.161E-03  CYAN =1.055E-03  O&G =8.430E-03  PHEN=1.933E-04  TSS =9.831E-02
SFIDE=2.039E-04  FLIDE=1.573E-02  TI  =2.675E-05  ZN  =8.555E-04  NITR=6.728E-03
PB   =4.873E-05  MN   =7.752E-06  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.459E-01  BOD  =5.348E-03  HMET=2.977E-02  MO  =1.838E-04  ARS =7.752E-07
NI   =7.546E-06  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=9.647E+05  PET=1.835E+05  GAS=1.413E+06  ELEC=2.373E+06  HELEC=3.713E+05
OTH =3.127E+04  TOT=9.647E+06
```

Table B.193 Small Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.623E+07  PET=5.300E+06  GAS=1.401E+07  ELEC=1.533E+07  HELEC=8.678E+05
OTH =5.724E+05  TOT=5.268E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.352E+00  NOX =4.364E+01  SOX =1.118E+00  HC=3.672E-01  CO=4.727E+00
ALD =4.030E-01  DACD=1.912E-04  HMET=2.558E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    33874.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.298E-02  TSS=1.440E+00  SFIDE=3.326E-04  FLIDE=9.557E-04
TFE =1.287E-02  DFE=7.439E-03  ZN =1.474E-04  PB   =2.281E-04  MN   =3.693E-03
COD =2.105E+00  CU =0.0        TDS=6.846E+00  BOD  =1.321E+00  HMET =3.986E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.605E+00  NOX  =2.403E-01  SOX=4.321E+00  HC  =6.273E+00  CO =2.349E+01
GFL =7.328E-02  PFL  =2.990E-02  AMM=2.852E-02  HMET=4.426E-01  ALD=1.065E-08
ORG =5.856E+00  SFIDE=3.087E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      617.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.158E-01  CYAN =2.023E-02  O&G =2.090E-02  PHEN=3.126E-03  TSS =3.267E-01
SFIDE=2.231E-04  FLIDE=5.528E-02  TI  =0.0        ZN  =1.290E-03  NITR=8.606E-03
PB   =1.038E-04  MN   =0.0        COD =1.798E-02  AL  =5.597E-03  CU  =1.599E-05
TDS  =9.744E-01  BOD  =1.409E-02  HMET=6.532E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=7.320E+05  PET=4.271E+05  GAS=1.378E+06  ELEC=1.659E+06  HELEC=0.0
OTH =2.994E+05  TOT=4.497E+06
```

Table B.194 Small Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.713E+07  PET=5.587E+06  GAS=1.624E+07  ELEC=1.598E+07  HELEC=8.911E+05
OTH =2.896E+05  TOT=5.733E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.723E+00  NOX =4.421E+01  SOX =1.126E+00  HC=3.736E-01  CO=4.777E+00
ALD =4.051E-01  DACD=1.976E-04  HMET=1.789E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31720.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.561E-03  TSS=1.433E+00  SFIDE=0.0        FLIDE=9.475E-04
TFE =1.304E-02  DFE=7.540E-03  ZN =3.425E-06  PB   =2.650E-06  MN   =3.742E-03
COD =2.117E+00  CU =0.0        TDS=7.165E+00  BOD  =1.366E+00  HMET =5.147E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.924E+00  NOX  =2.459E-01  SOX=8.694E+00  HC  =6.842E+00  CO =2.380E+01
GFL =7.511E-02  PFL  =3.137E-02  AMM=2.933E-02  HMET=3.259E-01  ALD=1.065E-08
ORG =5.617E+00  SFIDE=3.285E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      559.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.174E-01  CYAN =2.050E-02  O&G =2.141E-02  PHEN=3.163E-03  TSS =4.660E-01
SFIDE=2.243E-04  FLIDE=5.647E-02  TI  =0.0        ZN  =1.089E-03  NITR=8.670E-03
PB   =6.350E-05  MN   =0.0        COD =1.806E-02  AL  =5.747E-03  CU  =1.642E-05
TDS  =4.563E-01  BOD  =1.573E-02  HMET=9.494E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =7.113E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.349E+06  PET=6.391E+05  GAS=3.430E+06  ELEC=2.076E+06  HELEC=0.0
OTH =1.206E+04  TOT=8.328E+06
```

Table B.195 Small Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.430E+07  PET=6.056E+06  GAS=1.737E+07  ELEC=1.589E+07  HELEC=1.274E+06
OTH =5.157E+05  TOT=5.559E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.110E+00  NOX =3.965E+01  SOX =1.180E+00  HC=3.087E-01  CO=4.578E+00
ALD =4.449E-01  DACD=1.123E-04  HMET=2.016E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30785.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.460E-02  TSS=1.531E+00  SFIDE=3.111E-04  FLIDE=1.054E-03
TFE =1.167E-02  DFE=6.749E-03  ZN =1.375E-04  PB   =2.131E-04  MN   =3.359E-03
COD =2.327E+00  CU =0.0        TDS=8.926E+00  BOD  =1.424E+00  HMET =4.183E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.302E+00  NOX  =2.958E-01  SOX=4.368E+00  HC  =9.033E+00  CO =2.152E+01
GFL =1.169E-01  PFL  =1.919E-02  AMM=1.909E-02  HMET=4.131E-01  ALD=1.065E-08
ORG =6.426E+00  SFIDE=1.925E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      612.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.050E-01  CYAN =1.837E-02  O&G =2.187E-02  PHEN=2.884E-03  TSS =3.663E-01
SFIDE=2.312E-04  FLIDE=8.192E-02  TI  =0.0        ZN  =1.281E-03  NITR=8.653E-03
PB   =1.009E-04  MN   =0.0        COD =2.340E-02  AL  =9.149E-03  CU  =2.614E-05
TDS  =1.124E+00  BOD  =2.302E-02  HMET=4.076E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=6.673E+05  PET=3.832E+05  GAS=1.324E+06  ELEC=1.482E+06  HELEC=0.0
OTH =2.702E+05  TOT=4.128E+06
```

Table B.196 Small Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.645E+07  PET=6.821E+06  GAS=2.135E+07  ELEC=1.807E+07  HELEC=2.211E+06
OTH =2.773E+05  TOT=6.565E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.948E+00  NOX =4.157E+01  SOX =1.223E+00  HC=3.269E-01  CO=4.775E+00
ALD =4.598E-01  DACD=1.253E-04  HMET=1.580E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    29767.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.697E-03  TSS=1.571E+00  SFIDE=0.0        FLIDE=1.076E-03
TFE =1.224E-02  DFE=7.080E-03  ZN =2.918E-06  PB   =2.258E-06  MN   =3.523E-03
COD =2.404E+00  CU =0.0        TDS=9.804E+00  BOD  =1.526E+00  HMET =6.057E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.386E+00  NOX  =3.169E-01  SOX=1.115E+01  HC  =1.042E+01  CO =2.255E+01
GFL =1.238E-01  PFL  =2.249E-02  AMM=2.087E-02  HMET=4.418E-01  ALD=1.065E-08
ORG =6.381E+00  SFIDE=2.295E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      590.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.102E-01  CYAN =1.927E-02  O&G =2.339E-02  PHEN=3.018E-03  TSS =5.731E-01
SFIDE=2.390E-04  FLIDE=8.647E-02  TI  =0.0        ZN  =1.126E-03  NITR=8.973E-03
PB   =6.511E-05  MN   =0.0        COD =2.432E-02  AL  =9.699E-03  CU  =2.771E-05
TDS  =7.088E-01  BOD  =2.698E-02  HMET=8.341E-02  MO  =3.993E-04  ARS =0.0
NI   =0.0        OTH  =9.741E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.983E+06  PET=8.763E+05  GAS=4.597E+06  ELEC=2.881E+06  HELEC=8.607E+05
OTH =1.626E+04  TOT=1.146E+07
```

Table B.197 Medium Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.915E+07  PET=7.325E+06  GAS=2.063E+07  ELEC=2.133E+07  HELEC=1.313E+06
OTH =8.946E+05  TOT=7.111E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.786E+00  NOX =4.886E+01  SOX =1.369E+00  HC=4.001E-01  CO=5.495E+00
ALD =5.073E-01  OACD=1.828E-04  HMET=4.151E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39773.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.426E-02  TSS=1.788E+00  SFIDE=6.245E-04  FLIDE=1.212E-03
TFE =1.439E-02  DFE=8.319E-03  ZN =2.732E-04  PB   =4.256E-04  MN   =4.134E-03
COD =2.652E+00  CU =0.0        TDS=1.056E+01  BOD  =1.673E+00  HMET =6.552E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.020E+01  NOX  =3.479E-01  SOX=6.463E+00  HC  =1.114E+01  CO =2.649E+01
GFL =1.141E-01  PFL  =3.241E-02  AMM=2.843E-02  HMET=8.222E-01  ALD=1.065E-08
ORG =7.542E+00  SFIDE=4.194E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      819.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.295E-01  CYAN =2.263E-02  O&G =2.677E-02  PHEN=3.531E-03  TSS =5.456E-01
SFIDE=2.642E-04  FLIDE=8.610E-02  TI  =0.0        ZN  =1.709E-03  NITR=1.049E-02
PB   =1.523E-04  MN   =0.0        COD =3.826E-02  AL  =1.998E-02  CU  =5.708E-05
TDS  =1.842E+00  BOD  =2.834E-02  HMET=8.877E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.430E+06  PET=7.306E+05  GAS=2.354E+06  ELEC=2.846E+06  HELEC=0.0
OTH =5.199E+05  TOT=7.883E+06
```

Table B.198 Medium Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.927E+07  PET=7.944E+06  GAS=2.482E+07  ELEC=2.208E+07  HELEC=1.257E+06
OTH =3.809E+05  TOT=7.742E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.607E+00  NOX =5.061E+01  SOX =1.524E+00  HC=3.897E-01  CO=5.874E+00
ALD =5.765E-01  DACD=1.339E-04  HMET=1.992E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36218.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.218E-02  TSS=1.961E+00  SFIDE=0.0        FLIDE=1.350E-03
TFE =1.491E-02  DFE=8.619E-03  ZN =3.326E-06  PB   =2.574E-06  MN   =4.291E-03
COD =3.015E+00  CU =0.0        TDS=1.231E+01  BOD  =1.914E+00  HMET =7.628E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.062E+01  NOX  =3.977E-01  SOX=1.402E+01  HC  =1.303E+01  CO =2.759E+01
GFL =1.098E-01  PFL  =1.965E-02  AMM=2.335E-02  HMET=5.597E-01  ALD=1.065E-08
ORG =8.001E+00  SFIDE=2.888E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      696.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.341E-01  CYAN =2.347E-02  O&G =2.930E-02  PHEN=3.685E-03  TSS =7.327E-01
SFIDE=2.996E-04  FLIDE=8.521E-02  TI  =0.0        ZN  =1.442E-03  NITR=1.150E-02
PB   =8.313E-05  MN   =0.0        COD =3.886E-02  AL  =1.913E-02  CU  =5.465E-05
TDS  =8.919E-01  BOD  =3.392E-02  HMET=1.053E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.236E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.022E+06  PET=1.051E+06  GAS=5.530E+06  ELEC=3.928E+06  HELEC=0.0
OTH =2.045E+04  TOT=1.494E+07
```

Table B.199 Medium Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.499E+07  PET=6.404E+06  GAS=1.948E+07  ELEC=1.967E+07  HELEC=1.207E+06
OTH =6.538E+05  TOT=6.275E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.529E+00  NOX =3.947E+01  SOX =1.296E+00  HC=3.063E-01  CO=4.768E+00
ALD =5.016E-01  DACD=9.875E-05  HMET=2.457E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   31507.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.017E-02  TSS=1.640E+00  SFIDE=4.007E-04  FLIDE=6.408E-04
TFE =1.007E-02  DFE=3.614E-03  ZN =1.564E-04  PB   =2.475E-04  MN   =3.341E-03
COD =2.625E+00  CU =0.0        TDS=5.512E+00  BOD  =1.601E+00  HMET =1.631E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.131E+00  NOX  =3.004E-01  SOX=4.975E+00  HC  =1.156E+01  CO =2.151E+01
GFL =1.373E-01  PFL  =1.351E-02  AMM=1.765E-02  HMET=5.304E-01  ALD=1.065E-08
ORG =9.030E+00  SFIDE=2.135E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     667.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.986E-03  CYAN =1.440E-03  O&G =1.134E-02  PHEN=2.626E-04  TSS =1.108E-01
SFIDE=2.762E-04  FLIDE=2.062E-02  TI  =0.0        ZN  =1.369E-03  NITR=9.004E-03
PB   =1.145E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =9.163E-01  BOD  =8.851E-03  HMET=4.522E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.011E+06  PET=4.346E+05  GAS=1.357E+06  ELEC=1.887E+06  HELEC=0.0
OTH =3.336E+05  TOT=5.043E+06
```

Table B.200 Medium Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.770E+07  PET=7.031E+06  GAS=2.327E+07  ELEC=2.205E+07  HELEC=1.255E+06
OTH =3.529E+05  TOT=7.325E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.326E+00  NOX =4.093E+01  SOX =1.335E+00  HC=3.196E-01  CO=4.928E+00
ALD =5.157E-01  DACD=1.072E-04  HMET=1.724E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   29475.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.234E-03  TSS=1/673E+00  SFIDE=0.0        FLIDE=6.471E-04
TFE =1.045E-02  DFE=3.721E-03  ZN =2.640E-06  PB   =2.122E-06  MN   =3.467E-03
COD =2.698E+00  CU =0.0        TDS=5.662E+00  BOD  =1.705E+00  HMET =3.120E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.006E+01  NOX  =3.192E-01  SOX=1.222E+01  HC  =1.295E+01  CO =2.231E+01
GFL =1.426E-01  PFL  =1.526E-02  AMM=1.884E-02  HMET=4.917E-01  ALD=1.065E-08
ORG =8.952E+00  SFIDE=2.469E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      619.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.250E-03  CYAN =1.483E-03  O&G =1.173E-02  PHEN=2.717E-04  TSS =3.163E-01
SFIDE=2.865E-04  FLIDE=2.139E-02  TI  =0.0        ZN  =1.166E-03  NITR=9.291E-03
PB   =6.747E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.744E-01  BOD  =1.004E-02  HMET=9.108E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.085E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.983E+06  PET=8.582E+05  GAS=4.546E+06  ELEC=3.525E+06  HELEC=0.0
OTH =1.834E+04  TOT=1.315E+07
```

Table B.201 Medium Auto, Li/S EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.716E+07  PET=6.486E+06  GAS=2.232E+07  ELEC=2.464E+07  HELEC=2.203E+06
OTH =4.005E+05  TOT=8.371E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.237E+00  NOX =4.907E+01  SOX =1.388E+00  HC=3.864E-01  CO=5.541E+00
ALD =5.159E-01  DACD=1.529E-04  HMET=9.414E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    35615.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.067E-03  TSS=1.787E+00  SFIDE=3.645E-04  FLIDE=4.417E-03
TFE =1.251E-02  DFE=4.320E-03  ZN =2.803E-06  PB   =2.335E-06  MN   =4.157E-03
COD =2.697E+00  CU =6.568E-07  TDS=5.664E+00  BOD  =1.650E+00  HMET =1.803E-04
ARS =6.075E-07  CD =6.568E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.236E+01  NOX  =2.946E-01  SOX=3.482E+00  HC  =1.120E+01  CO =2.670E+01
GFL =2.471E-01  PFL  =1.077E-01  AMM=8.241E-01  HMET=7.837E-03  ALD=1.065E-08
ORG =8.947E+00  SFIDE=2.361E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      758.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.699E-03  CYAN =1.719E-03  O&G =1.388E-02  PHEN=3.218E-04  TSS =1.816E-01
SFIDE=3.429E-04  FLIDE=2.777E-02  TI  =6.404E-05  ZN  =1.393E-03  NITR=1.088E-02
PB   =7.896E-05  MN   =1.855E-05  COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =2.392E-01  BOD  =8.329E-03  HMET=4.999E-02  MO  =4.401E-04  ARS =1.855E-06
NI   =1.806E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.460E+06  PET=3.167E+05  GAS=3.604E+06  ELEC=6.132E+06  HELEC=9.485E+05
OTH =6.620E+04  TOT=2.366E+07
```

Table B.202 Medium Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.729E+07  PET=7.819E+06  GAS=2.236E+07  ELEC=2.254E+07  HELEC=1.483E+06
OTH =9.288E+05  TOT=7.279E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.906E+00  NOX =4.108E+01  SOX =1.238E+00  HC=3.416E-01  CO=4.771E+00
ALD =4.686E-01  DACD=1.555E-04  HMET=3.952E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34051.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.513E-02  TSS=1.565E+00  SFIDE=5.852E-04  FLIDE=6.043E-04
TFE =1.048E-02  DFE=3.439E-03  ZN =2.269E-04  PB   =3.602E-04  MN   =3.472E-03
COD =2.451E+00  CU =0.0        TDS=5.149E+00  BOD  =1.547E+00  HMET =3.128E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.532E+00  NOX  =2.889E-01  SOX=5.867E+00  HC  =1.152E+01  CO =2.231E+01
GFL =1.261E-01  PFL  =2.322E-02  AMM=2.418E-02  HMET=7.701E-01  ALD=1.065E-08
ORG =8.602E+00  SFIDE=4.095E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      747.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.273E-03  CYAN =1.367E-03  O&G =1.155E-02  PHEN=2.640E-04  TSS =1.716E-01
SFIDE=2.857E-04  FLIDE=2.084E-02  TI  =0.0        ZN  =1.481E-03  NITR=9.028E-03
PB   =1.369E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.275E+00  BOD  =8.749E-03  HMET=8.667E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.153E+06  PET=7.334E+05  GAS=2.334E+06  ELEC=2.705E+06  HELEC=0.0
OTH =4.963E+05  TOT=7.424E+06
```

Table B.203 Medium Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.715E+07  PET=8.420E+06  GAS=2.691E+07  ELEC=2.391E+07  HELEC=1.517E+06
OTH =4.255E+05  TOT=7.989E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.645E+00  NOX =4.245E+01  SOX =1.380E+00  HC=3.323E-01  CO=5.104E+00
ALD =5.327E-01  DACD=1.132E-04  HMET=1.902E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    30551.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.430E-03  TSS=1.730E+00  SFIDE=0.0        FLIDE=6.684E-04
TFE =1.084E-02  DFE=3.848E-03  ZN =2.523E-06  PB   =2.028E-06  MN   =3.596E-03
COD =2.787E+00  CU =0.0        TDS=5.848E+00  BOD  =1.769E+00  HMET =3.458E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.006E+01  NOX  =3.307E-01  SOX=1.296E+01  HC  =1.346E+01  CO =2.318E+01
GFL =1.289E-01  PFL  =1.406E-02  AMM=1.976E-02  HMET=5.248E-01  ALD=1.065E-08
ORG =9.246E+00  SFIDE=2.800E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      632.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.520E-03  CYAN =1.533E-03  O&G =1.228E-02  PHEN=2.815E-04  TSS =3.415E-01
SFIDE=2.971E-04  FLIDE=2.168E-02  TI  =0.0        ZN  =1.228E-03  NITR=9.790E-03
PB   =7.088E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.910E-01  BOD  =1.043E-02  HMET=1.007E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.160E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.243E+06  PET=1.024E+06  GAS=5.613E+06  ELEC=3.997E+06  HELEC=0.0
OTH =1.408E+04  TOT=1.421E+07
```

Table B.204 Medium Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.175E+07  PET=6.234E+06  GAS=1.795E+07  ELEC=1.759E+07  HELEC=1.013E+06
OTH =6.786E+05  TOT=5.524E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.814E+00  NOX =3.483E+01  SOX =1.157E+00  HC=2.675E-01  CO=4.230E+00
ALD =4.490E-01  DACD=8.063E-05  HMET=2.233E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    27894.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.297E-03  TSS=1.466E+00  SFIDE=3.674E-04  FLIDE=5.738E-04
TFE =8.885E-03  DFE=3.228E-03  ZN =1.432E-04  PB   =2.268E-04  MN   =2.949E-03
COD =2.349E+00  CU =0.0        TDS=4.934E+00  BOD  =1.433E+00  HMET =1.462E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.794E+00  NOX  =2.692E-01  SOX=4.471E+00  HC  =1.035E+01  CO =1.902E+01
GFL =1.071E-01  PFL  =1.052E-02  AMM=1.485E-02  HMET=4.857E-01  ALD=1.065E-08
ORG =8.090E+00  SFIDE=1.914E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      584.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.164E-03  CYAN =1.287E-03  O&G =1.015E-02  PHEN=2.329E-04  TSS =9.910E-02
SFIDE=2.439E-04  FLIDE=1.786E-02  TI  =0.0        ZN  =1.240E-03  NITR=8.141E-03
PB   =1.040E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.362E-01  BOD  =7.943E-03  HMET=4.053E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=7.444E+05  PET=4.395E+05  GAS=1.435E+06  ELEC=1.727E+06  HELEC=0.0
OTH =3.149E+05  TOT=4.664E+06
```

Table B.205 Medium Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.372E+07  PET=6.876E+06  GAS=2.162E+07  ELEC=2.006E+07  HELEC=1.054E+06
OTH =3.920E+05  TOT=6.486E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.543E+00  NOX =3.613E+01  SOX =1.192E+00  HC=2.792E-01  CO=4.374E+00
ALD =4.619E-01  DACD=8.783E-05  HMET=1.563E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   26005.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.019E-03  TSS=1.496E+00  SFIDE=0.0        FLIDE=5.796E-04
TFE =9.224E-03  DFE=3.326E-03  ZN =2.187E-06  PB   =1.759E-06  MN   =3.061E-03
COD =2.417E+00  CU =0.0        TDS=5.071E+00  BOD  =1.528E+00  HMET =2.832E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.629E+00  NOX  =2.865E-01  SOX=1.112E+01  HC  =1.162E+01  CO =1.974E+01
GFL  =1.115E-01  PFL  =1.194E-02  AMM=1.588E-02  HMET=4.503E-01  ALD=1.065E-08
ORG =8.018E+00  SFIDE=2.226E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     539.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.399E-03  CYAN =1.326E-03  O&G =1.051E-02  PHEN=2.410E-04  TSS =2.877E-01
SFIDE=2.531E-04  FLIDE=1.854E-02  TI  =0.0        ZN  =1.055E-03  NITR=8.413E-03
PB   =6.094E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.477E-01  BOD  =9.029E-03  HMET=8.270E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =9.951E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.132E+06  PET=8.712E+05  GAS=4.519E+06  ELEC=3.524E+06  HELEC=0.0
OTH =1.107E+04  TOT=1.217E+07
```

Table B.206 Medium Auto, Li/Z EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.369E+07  PET=6.403E+06  GAS=2.018E+07  ELEC=2.172E+07  HELEC=1.867E+06
OTH =4.490E+05  TOT=7.380E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.440E+00  NOX =4.334E+01  SOX =1.239E+00  HC=3.371E-01  CO=4.916E+00
ALD =4.620E-01  DACD=1.259E-04  HMET=8.459E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31452.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.492E-04  TSS=1.599E+00  SFIDE=3.339E-04  FLIDE=4.032E-03
TFE =1.105E-02  DFE=3.871E-03  ZN =2.337E-06  PB   =1.953E-06  MN   =3.672E-03
COD =2.416E+00  CU =6.016E-07  TDS=5.073E+00  BOD  =1.478E+00  HMET =1.624E-04
ARS =5.565E-07  CD =6.016E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.042E+01  NOX  =2.639E-01  SOX=3.090E+00  HC  =1.000E+01  CO =2.365E+01
GFL =1.945E-01  PFL  =8.530E-02  AMM=7.530E-01  HMET=6.644E-03  ALD=1.065E-08
ORG =8.014E+00  SFIDE=2.126E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      655.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.683E-03  CYAN =1.541E-03  O&G =1.247E-02  PHEN=2.858E-04  TSS =1.638E-01
SFIDE=3.031E-04  FLIDE=2.395E-02  TI  =5.866E-05  ZN  =1.268E-03  NITR=9.908E-03
PB   =7.172E-05  MN   =1.700E-05  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.155E-01  BOD  =7.463E-03  HMET=4.502E-02  MO  =4.031E-04  ARS =1.700E-06
NI   =1.654E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.115E+06  PET=4.024E+05  GAS=3.098E+06  ELEC=5.204E+06  HELEC=8.140E+05
OTH =6.856E+04  TOT=2.115E+07
```

Table B.207 Medium Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.068E+07  PET=6.779E+06  GAS=1.795E+07  ELEC=1.973E+07  HELEC=1.105E+06
OTH =7.907E+05  TOT=6.752E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.073E+00  NOX =5.492E+01  SOX =1.399E+00  HC=4.641E-01  CO=5.935E+00
ALD =5.033E-01  DACD=2.450E-04  HMET=3.566E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    43222.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.830E-02  TSS=1.806E+00  SFIDE=4.956E-04  FLIDE=1.197E-03
TFE =1.619E-02  DFE=9.361E-03  ZN =2.188E-04  PB   =3.392E-04  MN   =4.646E-03
COD =2.630E+00  CU =0.0        TDS=8.665E+00  BOD  =1.653E+00  HMET =5.155E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.810E+00  NOX  =3.034E-01  SOX=5.808E+00  HC  =8.058E+00  CO =2.954E+01
GFL =9.325E-02  PFL  =3.885E-02  AMM=3.637E-02  HMET=6.573E-01  ALD=1.065E-08
ORG =7.378E+00  SFIDE=3.987E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      799.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.458E-01  CYAN =2.545E-02  O&G =2.633E-02  PHEN=3.932E-03  TSS =4.169E-01
SFIDE=2.787E-04  FLIDE=7.007E-02  TI  =0.0        ZN  =1.664E-03  NITR=1.077E-02
PB   =1.396E-04  MN   =0.0        COD =2.266E-02  AL  =7.128E-03  CU  =2.037E-05
TDS  =1.374E+00  BOD  =1.822E-02  HMET=8.437E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.091E+06  PET=6.364E+05  GAS=2.053E+06  ELEC=2.472E+06  HELEC=0.0
OTH =4.462E+05  TOT=6.700E+06
```

Table B.208 Medium Auto Ni/Zn EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.133E+07  PET=6.959E+06  GAS=2.025E+07  ELEC=1.990E+07  HELEC=1.109E+06
OTH =3.604E+05  TOT=7.144E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.371E+00  NOX =5.498E+01  SOX =1.400E+00  HC=4.647E-01  CO=5.940E+00
ALD =5.036E-01  DACD=2.460E-04  HMET=2.236E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   39447.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.191E-03  TSS=1.781E+00  SFIDE=0.0        FLIDE=1.178E-03
TFE =1.622E-02  DFE=9.377E-03  ZN =4.256E-06  PB   =3.294E-06  MN   =4.654E-03
COD =2.631E+00  CU =0.0        TDS=8.918E+00  BOD  =1.699E+00  HMET =6.427E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.873E+00  NOX  =3.059E-01  SOX=1.090E+01  HC  =8.528E+00  CO =2.959E+01
GFL =9.348E-02  PFL  =3.911E-02  AMM=3.651E-02  HMET=4.103E-01  ALD=1.065E-08
ORG =6.982E+00  SFIDE=4.094E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     696.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.460E-01  CYAN =2.549E-02  O&G =2.663E-02  PHEN=3.934E-03  TSS =5.820E-01
SFIDE=2.788E-04  FLIDE=7.026E-02  TI  =0.0        ZN  =1.353E-03  NITR=1.078E-02
PB   =7.893E-05  MN   =0.0        COD =2.246E-02  AL  =7.154E-03  CU  =2.044E-05
TDS  =5.692E-01  BOD  =1.961E-02  HMET=1.186E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =8.957E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.699E+06  PET=8.048E+05  GAS=4.319E+06  ELEC=2.615E+06  HELEC=0.0
OTH =1.519E+04  TOT=1.049E+07
```

Table B.209 Medium Auto Pb/Acid EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.779E+07  PET=7.527E+06  GAS=2.169E+07  ELEC=2.016E+07  HELEC=1.543E+06
OTH =8.033E+05  TOT=6.976E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.564E+00  NOX =4.763E+01  SOX =1.403E+00  HC=3.742E-01  CO=5.475E+00
ALD =5.277E-01  DACD=1.421E-04  HMET=3.336E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    38613.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.290E-02  TSS=1.833E+00  SFIDE=5.852E-04  FLIDE=1.259E-03
TFE =1.402E-02  DFE=8.106E-03  ZN =2.567E-04  PB   =3.993E-04  MN   =4.033E-03
COD =2.760E+00  CU =0.0        TDS=1.089E+01  BOD  =1.694E+00  HMET =5.322E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.059E+01  NOX  =3.594E-01  SOX=6.266E+00  HC  =1.129E+01  CO =2.582E+01
GFL =1.416E-01  PFL  =2.530E-02  AMM=2.373E-02  HMET=7.719E-01  ALD=1.065E-08
ORG =7.796E+00  SFIDE=2.488E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      796.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.261E-01  CYAN =2.207E-02  O&G =2.642E-02  PHEN=3.461E-03  TSS =4.504E-01
SFIDE=2.742E-04  FLIDE=9.890E-02  TI  =0.0        ZN  =1.659E-03  NITR=1.029E-02
PB   =1.464E-04  MN   =0.0        COD =2.813E-02  AL  =1.108E-02  CU  =3.167E-05
TDS  =1.754E+00  BOD  =2.898E-02  HMET=5.267E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.255E+06  PET=7.207E+05  GAS=2.491E+06  ELEC=2.788E+06  HELEC=0.0
OTH =5.082E+05  TOT=7.765E+06
```

Table B.210 Medium Auto Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.914E+07  PET=7.929E+06  GAS=2.488E+07  ELEC=2.103E+07  HELEC=1.566E+06
OTH =3.180E+05  TOT=7.643E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.078E+00  NOX =4.817E+01  SOX =1.416E+00  HC=3.790E-01  CO=5.531E+00
ALD =5.323E-01  DACD=1.458E-04  HMET=1.857E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34492.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.132E-02  TSS=1.819E+00  SFIDE=0.0        FLIDE=1.246E-03
TFF =1.419E-02  DFE=8.204E-03  ZN =3.378E-06  PB   =2.614E-06  MN   =4.082E-03
COD =2.783E+00  CU =0.0        TDS=1.138E+01  BOD  =1.768E+00  HMET =7.082E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.093E+01  NOX  =3.676E-01  SOX=1.316E+01  HC  =1.213E+01  CO =2.613E+01
GFL =1.435E-01  PFL  =2.623E-02  AMM=2.425E-02  HMET=5.252E-01  ALD=1.065E-08
ORG =7.387E+00  SFIDE=2.675E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      685.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.277E-01  CYAN =2.233E-02  O&G =2.713E-02  PHEN=3.497E-03  TSS =6.703E-01
SFIDE=2.766E-04  FLIDE=1.002E-01  TI  =0.0        ZN  =1.304E-03  NITR=1.039E-02
PB   =7.540E-05  MN   =0.0        COD =2.818E-02  AL  =1.125E-02  CU  =3.213E-05
TDS  =8.260E-01  BOD  =3.142E-02  HMET=9.804E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.158E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.359E+06  PET=1.042E+06  GAS=5.467E+06  ELEC=3.426E+06  HELEC=0.0
OTH =1.917E+04  TOT=1.363E+07
```

Table B.211 Large Auto Pb/Acid EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.256E+07  PET=8.649E+06  GAS=2.435E+07  ELEC=2.508E+07  HELEC=1.556E+06
OTH =1.019E+06  TOT=8.375E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.200E+00  NOX =5.808E+01  SOX =1.631E+00  HC=4.746E-01  CO=6.539E+00
ALD =4.052E-01  DACD=2.150E-04  HMET=4.701E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    46877.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.752E-02  TSS=2.128E+00  SFIDE=6.904E-04  FLIDE=1.444E-03
TFE =1.710E-02  DFE=9.889E-03  ZN =3.023E-04  PB   =4.707E-04  MN   =4.915E-03
COD =3.164E+00  CU =0.0        TDS=1.252E+01  BOD  =1.993E+00  HMET =7.700E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.198E+01  NOX  =4.129E-01  SOX=7.434E+00  HC  =1.315E+01  CO =3.150E+01
GFL =1.353E-01  PFL  =3.795E-02  AMM=3.354E-02  HMET=9.097E-01  ALD=1.065E-08
ORG =8.953E+00  SFIDE=4.920E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      959.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.539E-01  CYAN =2.690E-02  O&G =3.179E-02  PHEN=4.198E-03  TSS =6.450E-01
SFIDE=3.151E-04  FLIDE=1.022E-01  TI  =0.0        ZN  =2.002E-03  NITR=1.250E-02
PB   =1.748E-04  MN   =0.0        COD =4.544E-02  AL  =2.368E-02  CU  =6.767E-05
TDS  =2.090E+00  BOD  =3.338E-02  HMET=1.041E-01  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.581E+06  PET=8.078E+05  GAS=2.602E+06  ELEC=3.146E+06  HELEC=0.0
OTH =5.747E+05  TOT=8.715E+06
```

Table B.212 Large Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.236E+07  PET=9.282E+06  GAS=2.873E+07  ELEC=2.562E+07  HELEC=1.484E+06
OTH =4.473E+05  TOT=8.972E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.005E+01  NOX =5.995E+01  SOX =1.810E+00  HC=4.605E-01  CO=6.965E+00
ALD =6.851E-01  DACD=1.561E-04  HMET=2.222E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    42896.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.401E-02  TSS=2.328E+00  SFIDE=0.0        FLIDE=1.604E-03
TFE =1.765E-02  DFE=1.021E-02  ZN =3.952E-06  PB   =3.059E-06  MN   =5.083E-03
COD =3.583E+00  CU =0.0        TDS=1.446E+01  BOD  =2.264E+00  HMET =8.701E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.232E+01  NOX  =4.688E-01  SOX=1.534E+01  HC  =1.517E+01  CO =3.268E+01
GFL =1.296E-01  PFL  =2.264E-02  AMM=2.738E-02  HMET=5.952E-01  ALD=1.065E-08
ORG =9.508E+00  SFIDE=3.335E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      818.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.588E-01  CYAN =2.780E-02  O&G =3.458E-02  PHEN=4.366E-03  TSS =8.356E-01
SFIDE=3.560E-04  FLIDE=1.007E-01  TI  =0.0        ZN  =1.711E-03  NITR=1.364E-02
PB   =9.867E-05  MN   =0.0        COD =4.600E-02  AL  =2.258E-02  CU  =6.452E-05
TDS  =1.032E+00  BOD  =3.939E-02  HMET=1.175E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.311E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.208E+06  PET=1.116E+06  GAS=5.869E+06  ELEC=4.169E+06  HELEC=0.0
OTH =2.171E+04  TOT=1.585E+07
```

Table B.213 Large Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.794E+07  PET=7.678E+06  GAS=2.335E+07  ELEC=2.354E+07  HELEC=1.451E+06
OTH =7.693E+05  TOT=7.515E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.826E+00  NOX =4.744E+01  SOX =1.559E+00  HC=3.679E-01  CO=5.733E+00
ALD =6.035E-01  DACD=1.182E-04  HMET=2.869E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37720.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.178E-02  TSS=1.972E+00  SFIDE=4.622E-04  FLIDE=7.703E-04
TFE =1.210E-02  DFE=4.347E-03  ZN =1.805E-04  PB   =2.856E-04  MN   =4.016E-03
COD =3.158E+00  CU =0.0        TDS=6.631E+00  BOD  =1.926E+00  HMET =1.947E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.092E+01  NOX  =3.606E-01  SOX=5.885E+00  HC  =1.386E+01  CO =2.585E+01
GFL =1.649E-01  PFL  =1.611E-02  AMM=2.115E-02  HMET=6.121E-01  ALD=1.065E-08
ORG =1.085E+01  SFIDE=2.550E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      796.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.397E-03  CYAN =1.732E-03  O&G =1.363E-02  PHEN=3.158E-04  TSS =1.326E-01
SFIDE=3.320E-04  FLIDE=2.479E-02  TI  =0.0        ZN  =1.634E-03  NITR=1.083E-02
PB   =1.353E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.066E+00  BOD  =1.060E-02  HMET=5.400E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.166E+06  PET=5.013E+05  GAS=1.565E+06  ELEC=2.177E+06  HELEC=0.0
OTH =3.848E+05  TOT=5.816E+06
```

Table B.214 Large Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.068E+07  PET=8.287E+06  GAS=2.723E+07  ELEC=2.584E+07  HELEC=1.495E+06
OTH =4.177E+05  TOT=8.568E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.613E+00  NOX =4.879E+01  SOX =1.595E+00  HC=3.801E-01  CO=5.880E+00
ALD =6.164E-01  DACD=1.261E-04  HMET=1.942E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    35131.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.506E-03  TSS=1.999E+00  SFIDE=0.0        FLIDE=7.734E-04
TFE =1.245E-02  DFE=4.446E-03  ZN =3.155E-06  PB   =2.537E-06  MN   =4.133E-03
COD =3.225E+00  CU =0.0        TDS=6.767E+00  BOD  =2.030E+00  HMET =3.524E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.178E+01  NOX  =3.783E-01  SOX=1.351E+01  HC  =1.522E+01  CO =2.659E+01
GFL =1.699E-01  PFL  =1.775E-02  AMM=2.227E-02  HMET=5.294E-01  ALD=1.065E-08
ORG =1.070E+01  SFIDE=2.878E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      732.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.641E-03  CYAN =1.771E-03  O&G =1.400E-02  PHEN=3.241E-04  TSS =3.520E-01
SFIDE=3.415E-04  FLIDE=2.550E-02  TI  =0.0        ZN  =1.392E-03  NITR=1.109E-02
PB   =8.056E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.189E-01  BOD  =1.177E-02  HMET=1.026E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.166E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.206E+06  PET=9.223E+05  GAS=4.885E+06  ELEC=3.788E+06  HELEC=0.0
OTH =1.971E+04  TOT=1.413E+07
```

Table B.215 Large Auto, Li/S EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.025E+07  PET=7.731E+06  GAS=2.640E+07  ELEC=2.892E+07  HELEC=2.553E+06
OTH =4.725E+05  TOT=9.802E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.572E+00  NOX =5.796E+01  SOX =1.656E+00  HC=4.557E-01  CO=6.575E+00
ALD =6.178E-01  DACD=1.777E-04  HMET=1.110E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    42052.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.261E-03  TSS=2.129E+00  SFIDE=4.054E-04  FLIDE=4.967E-03
TFE =1.478E-02  DFE=5.120E-03  ZN =3.343E-06  PB   =2.778E-06  MN   =4.911E-03
COD =3.230E+00  CU =7.304E-07  TDS=6.783E+00  BOD  =1.974E+00  HMET =2.125E-04
ARS =6.756E-07  CD =7.304E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.443E+01  NOX  =3.526E-01  SOX=4.134E+00  HC  =1.337E+01  CO =3.154E+01
GFL =2.866E-01  PFL  =1.207E-01  AMM=9.179E-01  HMET=9.385E-03  ALD=1.065E-08
ORG =1.072E+01  SFIDE=2.782E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      891.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.028E-02  CYAN =2.038E-03  O&G =1.642E-02  PHEN=3.806E-04  TSS =2.104E-01
SFIDE=4.051E-04  FLIDE=3.266E-02  TI  =7.121E-05  ZN  =1.648E-03  NITR=1.289E-02
PB   =9.351E-05  MN   =2.063E-05  COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =2.831E-01  BOD  =9.959E-03  HMET=5.890E-02  MO  =4.894E-04  ARS =2.063E-06
NI   =2.009E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.735E+06  PET=3.522E+05  GAS=4.007E+06  ELEC=6.819E+06  HELEC=1.055E+06
OTH =7.361E+04  TOT=2.631E+07
```

Table B.216 Large Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=2.050E+07  PET=9.258E+06  GAS=2.647E+07  ELEC=2.674E+07  HELEC=1.749E+06
OTH =1.122E+06  TOT=8.629E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.177E+00  NOX =4.844E+01  SOX =1.457E+00  HC=4.035E-01  CO=5.621E+00
ALD =5.511E-01  DACD=1.849E-04  HMET=4.801E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    40392.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=1.857E-02  TSS=1.843E+00  SFIDE=7.207E-04  FLIDE=7.116E-04
TFE =1.235E-02    DFE=4.047E-03  ZN =2.793E-04  PB   =4.436E-04  MN   =4.094E-03
COD =2.882E+00    CU =0.0        TDS=6.057E+00  BOD  =1.821E+00  HMET =3.724E-04
ARS =0.0          CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.133E+01  NOX  =3.411E-01  SOX=7.065E+00  HC  =1.364E+01  CO =2.631E+01
GFL =1.488E-01  PFL  =2.769E-02  AMM=2.868E-02  HMET=9.481E-01  ALD=1.065E-08
ORG =1.014E+01  SFIDE=4.876E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      891.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.577E-03  CYAN =1.609E-03  O&G =1.361E-02  PHEN=3.111E-04  TSS =2.040E-01
SFIDE=3.369E-04  FLIDE=2.457E-02  TI  =0.0        ZN  =1.763E-03  NITR=1.063E-02
PB   =1.651E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.558E+00  BOD  =1.036E-02  HMET=1.032E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.420E+06  PET=9.032E+05  GAS=2.875E+06  ELEC=3.331E+06  HELEC=0.0
OTH =6.112E+05  TOT=9.144E+06
```

Table B.217 Large Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=2.018E+07  PET=9.901E+06  GAS=3.166E+07  ELEC=2.813E+07  HELEC=1.783E+06
OTH =5.004E+05  TOT=9.398E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.991E+00  NOX =4.990E+01  SOX =1.622E+00  HC=3.907E-01  CO=5.998E+00
ALD =6.260E-01  OACD=1.332E-04  HMET=2.242E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    35909.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.865E-03  TSS=2.033E+00  SFIDE=0.0        FLIDE=7.854E-04
TFE =1.274E-02  DFE=4.521E-03  ZN =2.964E-06  PB   =2.383E-06  MN   =4.226E-03
COD =3.275E+00  CU =0.0        TDS=6.872E+00  BOD  =2.079E+00  HMET =4.075E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.183E+01  NOX  =3.887E-01  SOX=1.528E+01  HC  =1.583E+01  CO =2.724E+01
GFL =1.515E-01  PFL  =1.656E-02  AMM=2.325E-02  HMET=6.194E-01  ALD=1.065E-08
ORG =1.086E+01  SFIDE=3.298E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      743.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.839E-03  CYAN =1.801E-03  O&G =1.444E-02  PHEN=3.308E-04  TSS =4.026E-01
SFIDE=3.491E-04  FLIDE=2.549E-02  TI  =0.0        ZN  =1.443E-03  NITR=1.151E-02
PB   =8.330E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.425E-01  BOD  =1.227E-02  HMET=1.188E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.369E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.647E+06  PET=1.209E+06  GAS=6.626E+06  ELEC=4.717E+06  HELEC=0.0
OTH =1.662E+04  TOT=1.677E+07
```

Table B.218 Large Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.729E+07  PET=9.021E+06  GAS=2.610E+07  ELEC=2.613E+07  HELEC=1.403E+06
OTH =1.258E+06  TOT=8.127E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.432E+00  NOX =4.809E+01  SOX =1.579E+00  HC=3.732E-01  CO=5.810E+00
ALD =6.111E-01  DACD=1.197E-04  HMET=4.664E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    41340.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.136E-02  TSS=2.015E+00  SFIDE=8.741E-04  FLIDE=7.916E-04
TFE =1.226E-02  DFE=4.404E-03  ZN =3.384E-04  PB   =5.378E-04  MN   =4.069E-03
COD =3.198E+00  CU =0.0        TDS=6.720E+00  BOD  =1.959E+00  HMET =2.241E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.181E+01  NOX  =3.813E-01  SOX=7.946E+00  HC  =1.508E+01  CO =2.624E+01
GFL =1.485E-01  PFL  =1.658E-02  AMM=2.143E-02  HMET=1.149E+00  ALD=1.065E-08
ORG =1.131E+01  SFIDE=2.934E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      912.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.507E-03  CYAN =1.755E-03  O&G =1.395E-02  PHEN=3.199E-04  TSS =1.482E-01
SFIDE=3.363E-04  FLIDE=2.463E-02  TI  =0.0        ZN  =1.920E-03  NITR=1.116E-02
PB   =1.879E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.812E+00  BOD  =1.167E-02  HMET=6.213E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.771E+06  PET=1.046E+06  GAS=3.414E+06  ELEC=4.110E+06  HELEC=0.0
OTH =7.491E+05  TOT=1.110E+07
```

Table B.219 Large Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.869E+07  PET=9.276E+06  GAS=2.948E+07  ELEC=2.730E+07  HELEC=1.400E+06
OTH =5.237E+05  TOT=8.841E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.851E+00  NOX =4.791E+01  SOX =1.576E+00  HC=3.712E-01  CO=5.791E+00
ALD =6.099E-01  DACD=1.189E-04  HMET=2.241E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    34479.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.911E-03  TSS=1.978E+00  SFIDE=0.0        FLIDE=7.653E-04
TFE =1.223E-02  DFE=4.395E-03  ZN =2.888E-06  PB   =2.322E-06  MN   =4.058E-03
COD =3.191E+00  CU =0.0        TDS=6.696E+00  BOD  =2.030E+00  HMET =4.048E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.175E+01  NOX  =3.831E-01  SOX=1.631E+01  HC  =1.573E+01  CO =2.617E+01
GFL =1.479E-01  PFL  =1.645E-02  AMM=2.133E-02  HMET=6.810E-01  ALD=1.065E-08
ORG =1.059E+01  SFIDE=3.055E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      723.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.485E-03  CYAN =1.751E-03  O&G =1.392E-02  PHEN=3.191E-04  TSS =4.187E-01
SFIDE=3.355E-04  FLIDE=2.457E-02  TI  =0.0        ZN  =1.396E-03  NITR=1.113E-02
PB   =8.061E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.406E-01  BOD  =1.226E-02  HMET=1.186E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.508E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.231E+06  PET=1.320E+06  GAS=6.847E+06  ELEC=5.339E+06  HELEC=0.0
OTH =1.677E+04  TOT=1.843E+07
```

Table B.220 Large Auto, Li/S EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.902E+07  PET=8.655E+06  GAS=2.778E+07  ELEC=3.053E+07  HELEC=2.725E+06
OTH =6.218E+05  TOT=1.047E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.834E+00  NOX =5.991E+01  SOX =1.660E+00  HC=4.682E-01  CO=6.705E+00
ALD =6.133E-01  DACD=1.826E-04  HMET=1.179E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   43540.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.315E-03  TSS=2.154E+00  SFIDE=5.399E-04  FLIDE=6.353E-03
TFE =1.527E-02  DFE=5.300E-03  ZN =3.145E-06  PB   =2.649E-06  MN   =5.077E-03
COD =3.206E+00  CU =9.728E-07  TDS=6.734E+00  BOD  =1.965E+00  HMET =2.266E-04
ARS =8.998E-07  CD =9.728E-08
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.488E+01  NOX  =3.508E-01  SOX=4.209E+00  HC  =1.338E+01  CO =3.268E+01
GFL =2.834E-01  PFL  =1.355E-01  AMM=1.214E+00  HMET=8.819E-03  ALD=1.065E-08
ORG =1.064E+01  SFIDE=2.967E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      920.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.062E-02  CYAN =2.110E-03  O&G =1.719E-02  PHEN=3.937E-04  TSS =2.394E-01
SFIDE=4.188E-04  FLIDE=3.350E-02  TI  =9.485E-05  ZN  =1.749E-03  NITR=1.362E-02
PB   =9.856E-05  MN   =2.748E-05  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.967E-01  BOD  =9.953E-03  HMET=6.282E-02  MO  =6.518E-04  ARS =2.748E-06
NI   =2.675E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.420E+06  PET=6.507E+05  GAS=5.010E+06  ELEC=8.414E+06  HELEC=1.316E+06
OTH =1.109E+05  TOT=3.420E+07
```

Table B.221 Large Auto, Pb/Acid EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.597E+07  PET=8.512E+06  GAS=2.254E+07  ELEC=2.477E+07  HELEC=1.388E+06
OTH =9.928E+05  TOT=8.479E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.014E+01  NOX =6.896E+01  SOX =1.757E+00  HC=5.829E-01  CO=7.452E+00
ALD =6.319E-01  OACD=3.078E-04  HMET=4.479E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   54273.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.298E-02  TSS=2.267E+00  SFIDE=6.222E-04  FLIDE=1.503E-03
TFE =2.033E-02  DFE=1.175E-02  ZN =2.747E-04  PB   =4.259E-04  MN   =5.834E-03
COD =3.301E+00  CU =0.0        TDS=1.088E+01  BOD  =2.075E+00  HMET =6.475E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.232E+01  NOX  =3.809E-01  SOX=7.293E+00  HC  =1.012E+01  CO =3.710E+01
GFL =1.171E-01  PFL  =4.882E-02  AMM=4.569E-02  HMET=8.253E-01  ALD=1.065E-08
ORG =9.263E+00  SFIDE=5.010E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1004.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.830E-01  CYAN =3.196E-02  O&G =3.306E-02  PHEN=4.937E-03  TSS =5.237E-01
SFIDE=3.499E-04  FLIDE=8.800E-02  TI  =0.0        ZN  =2.089E-03  NITR=1.352E-02
PB   =1.753E-04  MN   =0.0        COD =2.845E-02  AL  =8.954E-03  CU  =2.558E-05
TDS  =1.726E+00  BOD  =2.288E-02  HMET=1.060E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.369E+06  PET=7.990E+05  GAS=2.577E+06  ELEC=3.103E+06  HELEC=0.0
OTH =5.602E+05  TOT=8.412E+06
```

Table B.222 Large Auto, Ni/Zn EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.679E+07  PET=8.740E+06  GAS=2.543E+07  ELEC=2.500E+07  HELEC=1.393E+06
OTH =4.527E+05  TOT=8.972E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.051E+01  NOX =6.905E+01  SOX =1.759E+00  HC=5.837E-01  CO=7.460E+00
ALD =6.324E-01  DACD=3.091E-04  HMET=2.808E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    49544.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.029E-02  TSS=2.236E+00  SFIDE=0.0        FLIDE=1.479E-03
TFE =2.037E-02  DFE=1.178E-02  ZN =5.345E-06  PB   =4.137E-06  MN   =5.845E-03
COD =3.304E+00  CU =0.0        TDS=1.120E+01  BOD  =2.134E+00  HMET =8.072E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.240E+01  NOX  =3.842E-01  SOX=1.369E+01  HC  =1.071E+01  CO =3.716E+01
GFL =1.174E-01  PFL  =4.914E-02  AMM=4.587E-02  HMET=5.151E-01  ALD=1.065E-08
ORG =8.768E+00  SFIDE=5.144E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      874.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.834E-01  CYAN =3.202E-02  O&G =3.345E-02  PHEN=4.941E-03  TSS =7.310E-01
SFIDE=3.501E-04  FLIDE=8.826E-02  TI  =0.0        ZN  =1.700E-03  NITR=1.354E-02
PB   =9.913E-05  MN   =0.0        COD =2.821E-02  AL  =8.986E-03  CU  =2.568E-05
TDS  =7.149E-01  BOD  =2.463E-02  HMET=1.490E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.125E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.133E+06  PET=1.010E+06  GAS=5.422E+06  ELEC=3.283E+06  HELEC=0.0
OTH =1.907E+04  TOT=1.316E+07
```

Table B.223 Large Auto, Pb/Acid EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.304E+07  PET=9.751E+06  GAS=2.809E+07  ELEC=2.611E+07  HELEC=2.000E+06
OTH =1.036E+06  TOT=9.034E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.800E+00  NOX =6.175E+01  SOX =1.820E+00  HC=4.849E-01  CO=7.099E+00
ALD =6.844E-01  DACD=1.839E-04  HMET=4.297E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   50011.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.954E-02  TSS=2.377E+00  SFIDE=7.526E-04  FLIDE=1.632E-03
TFE =1.817E-02  DFE=1.051E-02  ZN =3.301E-04  PB   =5.135E-04  MN   =5.229E-03
COD =3.579E+00  CU =0.0        TDS=1.412E+01  BOD  =2.197E+00  HMET =6.890E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.372E+01  NOX  =4.659E-01  SOX=8.094E+00  HC  =1.463E+01  CO =3.348E+01
GFL =1.835E-01  PFL  =3.270E-02  AMM=3.073E-02  HMET=9.928E-01  ALD=1.065E-08
ORG =1.011E+01  SFIDE=3.217E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1031.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.635E-01  CYAN =2.861E-02  O&G =3.425E-02  PHEN=4.487E-03  TSS =5.835E-01
SFIDE=3.557E-04  FLIDE=1.282E-01  TI  =0.0        ZN  =2.148E-03  NITR=1.335E-02
PB   =1.891E-04  MN   =0.0        COD =3.647E-02  AL  =1.437E-02  CU  =4.104E-05
TDS  =2.262E+00  BOD  =3.754E-02  HMET=6.812E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.614E+06  PET=9.269E+05  GAS=3.203E+06  ELEC=3.586E+06  HELEC=0.0
OTH =6.536E+05  TOT=9.986E+06
```

Table B.224 Large Auto, Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.478E+07  PET=1.027E+07  GAS=3.219E+07  ELEC=2.723E+07  HELEC=2.030E+06
OTH =4.120E+05  TOT=9.893E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.046E+01  NOX =6.243E+01  SOX =1.836E+00  HC=4.912E-01  CO=7.170E+00
ALD =6.900E-01  DACD=1.889E-04  HMET=2.399E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   44707.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.464E-02  TSS=2.358E+00  SFIDE=0.0        FLIDE=1.615E-03
TFE =1.839E-02  DFE=1.063E-02  ZN =4.378E-06  PB   =3.388E-06  MN   =5.291E-03
COD =3.608E+00  CU =0.0        TDS=1.474E+01  BOD  =2.291E+00  HMET =9.158E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.414E+01  NOX  =4.762E-01  SOX=1.697E+01  HC  =1.570E+01  CO =3.387E+01
GFL =1.860E-01  PFL  =3.399E-02  AMM=3.142E-02  HMET=6.759E-01  ALD=1.065E-08
ORG =9.575E+00  SFIDE=3.466E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     888.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.655E-01  CYAN =2.895E-02  O&G =3.515E-02  PHEN=4.532E-03  TSS =8.667E-01
SFIDE=3.586E-04  FLIDE=1.299E-01  TI  =0.0        ZN  =1.690E-03  NITR=1.347E-02
PB   =9.773E-05  MN   =0.0        COD =3.653E-02  AL  =1.458E-02  CU  =4.164E-05
TDS  =1.069E+00  BOD  =4.066E-02  HMET=1.267E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.491E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.035E+06  PET=1.341E+06  GAS=7.035E+06  ELEC=4.409E+06  HELEC=0.0
OTH =2.467E+04  TOT=1.754E+07
```

Table B.225 Van - Ni/Zn EV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.671E+07  PET=1.091E+07  GAS=3.451E+07  ELEC=3.060E+07  HELEC=1.703E+06
OTH =5.197E+05  TOT=1.075E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.183E+01  NOX =6.832E+01  SOX =2.050E+00  HC=5.277E-01  CO=7.916E+00
ALD =7.748E-01  DACD=1.843E-04  HMET=2.894E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    48886.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.708E-02  TSS=2.638E+00  SFIDE=0.0        FLIDE=1.814E-03
TFF =2.012E-02  DFE=1.163E-02  ZN =4.470E-06  PB   =3.459E-06  MN   =5.791E-03
COD =4.052E+00  CU =0.0        TDS=1.680E+01  BOD  =2.587E+00  HMET =1.080E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.472E+01  NOX  =5.404E-01  SOX=2.086E+01  HC  =1.799E+01  CO =3.723E+01
GFL =1.487E-01  PFL  =2.743E-02  AMM=3.191E-02  HMET=8.583E-01  ALD=1.065E-08
ORG =1.075E+01  SFIDE=4.022E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      950.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.810E-01  CYAN =3.168E-02  O&G =3.975E-02  PHEN=4.971E-03  TSS =1.038E+00
SFIDE=4.027E-04  FLIDE=1.153E-01  TI  =0.0        ZN  =1.941E-03  NITR=1.548E-02
PB   =1.119E-04  MN   =0.0        COD =5.248E-02  AL  =2.592E-02  CU  =7.405E-05
TDS  =1.241E+00  BOD  =4.697E-02  HMET=1.530E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.899E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.644E+06  PET=1.615E+06  GAS=8.496E+06  ELEC=6.036E+06  HELEC=0.0
OTH =3.143E+04  TOT=2.295E+07
```

Table B.226 Van - Ni/Zn EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.802E+07  PET=1.082E+07  GAS=3.660E+07  ELEC=3.454E+07  HELEC=1.872E+06
OTH =5.371E+05  TOT=1.153E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.136E+01  NOX =6.093E+01  SOX =1.973E+00  HC=4.788E-01  CO=7.311E+00
ALD =7.606E-01  DACD=1.666E-04  HMET=3.006E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   43876.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.937E-03  TSS=2.473E+00  SFIDE=0.0        FLIDE=9.543E-04
TFE =1.555E-02  DFE=5.497E-03  ZN =3.894E-06  PB   =3.130E-06  MN   =5.160E-03
COD =3.979E+00  CU =0.0        TDS=8.350E+00  BOD  =2.546E+00  HMET =5.410E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.578E+01  NOX  =4.833E-01  SOX=2.231E+01  HC  =2.010E+01  CO =3.319E+01
GFL =2.127E-01  PFL  =2.453E-02  AMM=2.882E-02  HMET=9.514E-01  ALD=1.065E-08
ORG =1.320E+01  SFIDE=3.946E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     942.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.079E-02  CYAN =2.189E-03  O&G =1.742E-02  PHEN=4.032E-04  TSS =5.681E-01
SFIDE=4.262E-04  FLIDE=3.182E-02  TI  =0.0        ZN  =1.725E-03  NITR=1.375E-02
PB   =9.985E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =4.398E-01  BOD  =1.568E-02  HMET=1.589E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =2.108E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.794E+06  PET=1.667E+06  GAS=8.829E+06  ELEC=6.845E+06  HELEC=0.0
OTH =3.562E+04  TOT=2.553E+07
```

Table B.227 Van - Li/S EV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.754E+07  PET=9.875E+06  GAS=3.541E+07  ELEC=4.062E+07  HELEC=3.850E+06
OTH =6.429E+05  TOT=1.395E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.139E+01  NOX =7.828E+01  SOX =2.095E+00  HC=6.220E-01  CO=8.634E+00
ALD =7.657E-01  OACD=2.642E-04  HMET=1.518E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   56956.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.703E-03  TSS=2.724E+00  SFIDE=7.548E-04  FLIDE=8.766E-03
TFE =1.996E-02  DFE=6.772E-03  ZN =4.256E-06  PB   =3.590E-06  MN   =6.632E-03
COD =4.002E+00  CU =1.360E-06  TDS=8.407E+00  BOD  =2.455E+00  HMET =2.914E-04
ARS =1.258E-06  CD =1.360E-07
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.087E+01  NOX  =4.384E-01  SOX=5.415E+00  HC  =1.685E+01  CO =4.255E+01
GFL =4.309E-01  PFL  =2.165E-01  AMM=1.697E+00  HMET=1.163E-02  ALD=1.065E-08
ORG =1.328E+01  SFIDE=3.815E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1245.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.388E-02  CYAN =2.694E-03  O&G =2.199E-02  PHEN=5.100E-04  TSS =3.178E-01
SFIDE=5.466E-04  FLIDE=4.530E-02  TI  =1.326E-04  ZN  =2.208E-03  NITR=1.714E-02
PB   =1.243E-04  MN   =3.842E-05  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.785E-01  BOD  =1.246E-02  HMET=8.076E-02  MO  =9.112E-04  ARS =3.842E-06
NI   =3.740E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=5.093E+06  PET=6.558E+05  GAS=7.462E+06  ELEC=1.270E+07  HELEC=1.964E+06
OTH =1.371E+05  TOT=4.899E+07
```

Table B.228 Van - Ni/Zn EV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=2.407E+07  PET=1.173E+07  GAS=3.793E+07  ELEC=3.359E+07  HELEC=3.688E+06
OTH =5.882E+05  TOT=1.124E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.068E+01  NOX =5.812E+01  SOX =1.881E+00  HC=4.565E-01  CO=6.973E+00
ALD =7.255E-01  DACD=1.587E-04  HMET=2.819E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    41821.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.624E-03  TSS=2.359E+00  SFIDE=0.0        FLIDE=9.102E-04
TFE =1.484E-02  DFE=5.244E-03  ZN =3.435E-06  PB   =2.762E-06  MN   =4.922E-03
COD =3.796E+00  CU =0.0        TDS=7.964E+00  BOD  =2.425E+00  HMET =5.110E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.415E+01  NOX  =4.563E-01  SOX=1.970E+01  HC  =1.881E+01  CO =3.172E+01
GFL =1.766E-01  PFL  =2.002E-02  AMM=2.747E-02  HMET=8.232E-01  ALD=1.065E-08
ORG =1.259E+01  SFIDE=3.977E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      876.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.029E-02  CYAN =2.089E-03  O&G =1.679E-02  PHEN=3.846E-04  TSS =5.144E-01
SFIDE=4.065E-04  FLIDE=2.967E-02  TI  =0.0        ZN  =1.676E-03  NITR=1.337E-02
PB   =9.677E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =4.136E-01  BOD  =1.463E-02  HMET=1.493E-01  MO  =7.472E-04  ARS =0.0
NI   =0.0        OTH  =1.823E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=3.525E+06  PET=1.610E+06  GAS=8.821E+06  ELEC=6.281E+06  HELEC=1.610E+06
OTH =2.212E+04  TOT=2.233E+07
```

Table B.229 Van - Ni/Zn EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=2.282E+07  PET=1.121E+07  GAS=3.605E+07  ELEC=3.329E+07  HELEC=3.461E+06
OTH =6.260E+05  TOT=1.080E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.073E+01  NOX =5.679E+01  SOX =1.861E+00  HC=4.414E-01  CO=6.854E+00
ALD =7.199E-01  DACD=1.441E-04  HMET=2.878E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    40874.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.759E-03  TSS=2.336E+00  SFIDE=0.0        FLIDE=9.033E-04
TFE =1.450E-02  DFE=5.191E-03  ZN =3.409E-06  PB   =2.741E-06  MN   =4.811E-03
COD =3.767E+00  CU =0.0        TDS=7.904E+00  BOD  =2.412E+00  HMET =5.183E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.434E+01  NOX  =4.585E-01  SOX=2.143E+01  HC  =1.907E+01  CO =3.102E+01
GFL =1.756E-01  PFL  =2.025E-02  AMM=2.563E-02  HMET=9.187E-01  ALD=1.065E-08
ORG =1.250E+01  SFIDE=3.753E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      868.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.006E-02  CYAN =2.069E-03  O&G =1.649E-02  PHEN=3.778E-04  TSS =5.456E-01
SFIDE=3.976E-04  FLIDE=2.912E-02  TI  =0.0        ZN  =1.651E-03  NITR=1.317E-02
PB   =9.534E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =4.197E-01  BOD  =1.492E-02  HMET=1.523E-01  MO  =8.351E-04  ARS =0.0
NI   =0.0        OTH  =2.037E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.366E+06  PET=1.784E+06  GAS=9.252E+06  ELEC=7.214E+06  HELEC=1.800E+06
OTH =2.266E+04  TOT=2.491E+07
```

Table B.230 Van - Li/S EV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=2.326E+07  PET=1.037E+07  GAS=3.375E+07  ELEC=3.767E+07  HELEC=3.453E+06
OTH =7.588E+05  TOT=1.300E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.071E+01  NOX =7.303E+01  SOX =1.976E+00  HC=5.726E-01  CO=8.093E+00
ALD =7.250E-01  DACD=2.302E-04  HMET=1.443E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   53133.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.603E-03  TSS=2.577E+00  SFIDE=7.290E-04  FLIDE=8.449E-03
TFE =1.862E-02  DFE=6.417E-03  ZN =3.758E-06  PB   =3.184E-06  MN   =6.188E-03
COD =3.789E+00  CU =1.314E-06  TDS=7.960E+00  BOD  =2.326E+00  HMET =2.777E-04
ARS =1.215E-06  CD =1.314E-07
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.857E+01  NOX  =4.152E-01  SOX=5.075E+00  HC  =1.591E+01  CO =3.982E+01
GFL =3.585E-01  PFL  =1.810E-01  AMM=1.636E+00  HMET=1.042E-02  ALD=1.065E-08
ORG =1.257E+01  SFIDE=3.635E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1134.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.295E-02  CYAN =2.554E-03  O&G =2.091E-02  PHEN=4.786E-04  TSS =3.033E-01
SFIDE=5.104E-04  FLIDE=4.120E-02  TI  =1.281E-04  ZN  =2.129E-03  NITR=1.653E-02
PB   =1.196E-04  MN   =3.711E-05  COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.606E-01  BOD  =1.181E-02  HMET=7.696E-02  MO  =8.801E-04  ARS =3.711E-06
NI   =3.612E-05  OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.618E+06  PET=8.786E+05  GAS=6.765E+06  ELEC=1.136E+07  HELEC=1.777E+06
OTH =1.497E+05  TOT=4.618E+07
```

Table B.231 Van - Ni/Zn EV Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.810E+07  PET=9.358E+06  GAS=2.497E+07  ELEC=2.794E+07  HELEC=1.499E+06
OTH =1.441E+06  TOT=9.403E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.083E+01  NOX =7.045E+01  SOX =1.746E+00  HC=6.078E-01  CO=7.530E+00
ALD =6.222E-01  DACD=3.414E-04  HMET=6.688E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   59043.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.542E-02  TSS=2.278E+00  SFIDE=1.103E-03  FLIDE=1.499E-03
TFE =2.077E-02  DFE=1.201E-02  ZN =4.827E-04  PB   =7.518E-04  MN   =5.955E-03
COD =3.250E+00  CU =0.0        TDS=1.141E+01  BOD  =2.063E+00  HMET =7.460E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.403E+01  NOX  =3.945E-01  SOX=9.695E+00  HC  =1.133E+01  CO =3.780E+01
GFL =1.259E-01  PFL  =5.732E-02  AMM=4.963E-02  HMET=1.452E+00  ALD=1.065E-08
ORG =9.515E+00  SFIDE=5.746E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1164.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.870E-01  CYAN =3.263E-02  O&G =3.394E-02  PHEN=5.031E-03  TSS =5.700E-01
SFIDE=3.447E-04  FLIDE=9.299E-02  TI  =0.0        ZN  =2.381E-03  NITR=1.344E-02
PB   =2.335E-04  MN   =0.0        COD =2.926E-02  AL  =9.666E-03  CU  =2.762E-05
TDS  =2.661E+00  BOD  =2.633E-02  HMET=1.216E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.427E+06  PET=1.416E+06  GAS=4.568E+06  ELEC=5.501E+06  HELEC=0.0
OTH =9.930E+05  TOT=1.491E+07
```

Table B.232 Van - Ni/Zn EV Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.669E+07  PET=8.759E+06  GAS=2.623E+07  ELEC=2.524E+07  HELEC=1.374E+06
OTH =4.439E+05  TOT=9.105E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.043E+01  NOX =6.629E+01  SOX =1.667E+00  HC=5.659E-01  CO=7.125E+00
ALD =5.968E-01  DACD=3.089E-04  HMET=3.075E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    47567.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.094E-02  TSS=2.120E+00  SFIDE=0.0        FLIDE=1.396E-03
TFE =1.956E-02  DFE=1.131E-02  ZN =5.044E-06  PB   =3.903E-06  MN   =5.611E-03
COD =3.117E+00  CU =0.0        TDS=1.099E+01  BOD  =2.042E+00  HMET =8.656E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.257E+01  NOX  =3.722E-01  SOX=1.628E+01  HC  =1.092E+01  CO =3.565E+01
GFL =1.156E-01  PFL  =5.054E-02  AMM=4.538E-02  HMET=6.618E-01  ALD=1.065E-08
ORG =8.273E+00  SFIDE=5.258E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      857.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.761E-01  CYAN =3.074E-02  O&G =3.231E-02  PHEN=4.737E-03  TSS =7.863E-01
SFIDE=3.305E-04  FLIDE=8.615E-02  TI  =0.0        ZN  =1.611E-03  NITR=1.283E-02
PB   =9.394E-05  MN   =0.0        COD =2.708E-02  AL  =8.864E-03  CU  =2.533E-05
TDS  =7.481E-01  BOD  =2.554E-02  HMET=1.633E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =1.455E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=2.760E+06  PET=1.308E+06  GAS=7.017E+06  ELEC=4.248E+06  HELEC=0.0
OTH =2.468E+04  TOT=1.704E+07
```

Table B.233 Medium Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.642E+07  PET=1.089E+07  GAS=3.500E+07  ELEC=2.925E+07  HELEC=2.083E+06
OTH =4.280E+05  TOT=1.067E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.110E+01  NOX =6.358E+01  SOX =1.853E+00  HC=5.042E-01  CO=7.272E+00
ALD =6.945E-01  DACD=2.013E-04  HMET=2.875E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    45530.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.624E-02  TSS=2.381E+00  SFIDE=0.0        FLIDE=1.626E-03
TFE =1.873E-02  DFE=1.083E-02  ZN =4.407E-06  PB   =3.410E-06  MN   =5.387E-03
COD =3.632E+00  CU =0.0        TDS=1.538E+01  BOD  =2.338E+00  HMET =1.038E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.522E+01  NOX  =4.918E-01  SOX=2.134E+01  HC  =1.681E+01  CO =3.447E+01
GFL =1.908E-01  PFL  =3.737E-02  AMM=3.298E-02  HMET=9.051E-01  ALD=1.065E-08
ORG =9.638E+00  SFIDE=3.790E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      925.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.685E-01  CYAN =2.948E-02  O&G =3.615E-02  PHEN=4.611E-03  TSS =9.845E-01
SFIDE=3.610E-04  FLIDE=1.329E-01  TI  =0.0        ZN  =1.706E-03  NITR=1.359E-02
PB   =9.863E-05  MN   =0.0        COD =3.711E-02  AL  =1.496E-02  CU  =4.275E-05
TDS  =1.165E+00  BOD  =4.387E-02  HMET=1.519E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =2.004E+01
TOTAL BATTERY BTU BY FUEL TYPE
COAL=4.081E+06  PET=1.803E+06  GAS=9.460E+06  ELEC=5.929E+06  HELEC=0.0
OTH =3.317E+04  TOT=2.358E+07
```

Table B.234 Medium Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.859E+07  PET=7.560E+06  GAS=2.300E+07  ELEC=2.355E+07  HELEC=1.853E+06
OTH =9.940E+05  TOT=7.584E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.133E+00  NOX =5.221E+01  SOX =1.426E+00  HC=4.249E-01  CO=5.809E+00
ALD =5.246E-01  DACD=1.929E-04  HMET=4.123E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   43011.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.700E-02  TSS=1.862E+00  SFIDE=7.329E-04  FLIDE=1.256E-03
TFE =1.538E-02  DFE=8.890E-03  ZN =3.208E-04  PB   =5.000E-04  MN   =4.418E-03
COD =2.742E+00  CU =0.0        TDS=1.115E+01  BOD  =1.696E+00  HMET =4.099E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.198E+01  NOX  =3.663E-01  SOX=7.211E+00  HC  =1.203E+01  CO =2.831E+01
GEL =1.587E-01  PFL  =1.349E-01  AMM=3.013E-02  HMET=9.655E-01  ALD=1.065E-08
ORG =8.015E+00  SFIDE=2.987E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     905.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.384E-01  CYAN =2.419E-02  O&G =2.871E-02  PHEN=3.765E-03  TSS =6.204E-01
SFIDE=2.834E-04  FLIDE=1.159E-01  TI  =0.0        ZN  =1.871E-03  NITR=1.124E-02
PB   =1.710E-04  MN   =0.0        COD =4.864E-02  AL  =2.820E-02  CU  =8.056E-05
TDS  =2.063E+00  BOD  =3.060E-02  HMET=6.324E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.644E+06  PET=8.398E+05  GAS=2.706E+06  ELEC=3.271E+06  HELEC=0.0
OTH =5.976E+05  TOT=9.061E+06
```

Table B.235 Medium Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.585E+07  PET=6.325E+06  GAS=2.032E+07  ELEC=1.944E+07  HELEC=1.637E+06
OTH =3.523E+05  TOT=6.479E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.907E+00  NOX =4.547E+01  SOX =1.250E+00  HC=3.673E-01  CO=5.071E+00
ALD =4.605E-01  DACD=1.631E-04  HMET=1.412E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    32650.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.186E-03  TSS=1.597E+00  SFIDE=1.420E-05  FLIDE=1.077E-03
TFE =1.340E-02  DFE=7.749E-03  ZN =9.311E-06  PB   =1.248E-05  MN   =3.852E-03
COD =2.407E+00  CU =0.0        TDS=9.510E+00  BOD  =1.511E+00  HMET =4.112E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.635E+00  NOX  =3.108E-01  SOX=8.023E+00  HC  =1.005E+01  CO =2.469E+01
GFL =1.400E-01  PFL  =1.192E-01  AMM=2.572E-02  HMET=2.812E-01  ALD=1.065E-08
ORG =6.537E+00  SFIDE=2.420E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      635.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.206E-01  CYAN =2.108E-02  O&G =2.482E-02  PHEN=3.278E-03  TSS =6.359E-01
SFIDE=2.493E-04  FLIDE=1.023E-01  TI  =0.0        ZN  =1.245E-03  NITR=9.853E-03
PB   =7.294E-05  MN   =0.0        COD =4.259E-02  AL  =2.491E-02  CU  =7.118E-05
TDS  =6.887E-01  BOD  =2.534E-02  HMET=7.160E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.701E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.395E+06  PET=4.850E+05  GAS=2.551E+06  ELEC=1.812E+06  HELEC=0.0
OTH =9.436E+03  TOT=6.891E+06
```

Table B.236 Large Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=2.176E+07  PET=8.849E+06  GAS=2.693E+07  ELEC=2.755E+07  HELEC=2.188E+06
OTH =1.136E+06  TOT=8.876E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.526E+00  NOX =6.147E+01  SOX =1.679E+00  HC=5.001E-01  CO=6.839E+00
ALD =6.177E-01  DACD=2.268E-04  HMET=4.681E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    50831.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.076E-02  TSS=2.190E+00  SFIDE=8.225E-04  FLIDE=1.477E-03
TFE =1.810E-02  DFE=1.047E-02  ZN =3.602E-04  PB   =5.613E-04  MN   =5.202E-03
COD =3.229E+00  CU =0.0        TDS=1.308E+01  BOD  =1.996E+00  HMET =4.791E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.400E+01  NOX  =4.298E-01  SOX=8.293E+00  HC  =1.406E+01  CO =3.334E+01
GFL =1.873E-01  PFL  =1.592E-01  AMM=3.545E-02  HMET=1.084E+00  ALD=1.065E-08
ORG =9.407E+00  SFIDE=3.489E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     1054.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.629E-01  CYAN =2.848E-02  O&G =3.374E-02  PHEN=4.433E-03  TSS =7.299E-01
SFIDE=3.338E-04  FLIDE=1.368E-01  TI  =0.0        ZN  =2.178E-03  NITR=1.324E-02
PB   =1.964E-04  MN   =0.0        COD =5.736E-02  AL  =3.329E-02  CU  =9.512E-05
TDS  =2.350E+00  BOD  =3.572E-02  HMET=7.386E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.842E+06  PET=9.413E+05  GAS=3.032E+06  ELEC=3.666E+06  HELEC=0.0
OTH =6.697E+05  TOT=1.015E+07
```

Table B.237 Large Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.823E+07  PET=7.321E+06  GAS=2.336E+07  ELEC=2.225E+07  HELEC=1.839E+06
OTH =4.039E+05  TOT=7.440E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.988E+00  NOX =5.242E+01  SOX =1.453E+00  HC=4.215E-01  CO=5.868E+00
ALD =5.370E-01  DACD=1.831E-04  HMET=1.612E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    37631.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.060E-02  TSS=1.858E+00  SFIDE=1.506E-05  FLIDE=1.257E-03
TFE =1.545E-02  DFE=8.933E-03  ZN =1.015E-05  PB   =1.345E-05  MN   =4.441E-03
COD =2.807E+00  CU =0.0        TDS=1.106E+01  BOD  =1.760E+00  HMET =4.747E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.101E+01  NOX  =3.618E-01  SOX=9.204E+00  HC  =1.164E+01  CO =2.848E+01
GFL =1.574E-01  PFL  =1.338E-01  AMM=2.912E-02  HMET=3.197E-01  ALD=1.065E-08
ORG =7.608E+00  SFIDE=2.775E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      729.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.390E-01  CYAN =2.431E-02  O&G =2.871E-02  PHEN=3.783E-03  TSS =7.233E-01
SFIDE=2.897E-04  FLIDE=1.155E-01  TI  =0.0        ZN  =1.441E-03  NITR=1.141E-02
PB   =8.433E-05  MN   =0.0        COD =4.839E-02  AL  =2.798E-02  CU  =7.994E-05
TDS  =7.954E-01  BOD  =2.940E-02  HMET=8.202E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =6.512E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.593E+06  PET=5.539E+05  GAS=2.914E+06  ELEC=2.070E+06  HELEC=0.0
OTH =1.078E+04  TOT=7.871E+06
```

Table B.238 Medium Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.682E+07  PET=6.670E+06  GAS=2.523E+07  ELEC=2.935E+07  HELEC=1.634E+06
OTH =1.683E+06  TOT=8.178E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.823E+00  NOX =4.088E+01  SOX =1.240E+00  HC=3.271E-01  CO=4.762E+00
ALD =4.702E-01  DACD=1.289E-04  HMET=3.690E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   34536.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.639E-02  TSS=1.570E+00  SFIDE=6.632E-04  FLIDE=6.082E-04
TFE =1.042E-02  DFE=3.580E-03  ZN =2.574E-04  PB   =4.089E-04  MN   =3.458E-03
COD =2.459E+00  CU =0.0        TDS=5.169E+00  BOD  =1.515E+00  HMET =4.410E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.115E+01  NOX  =2.961E-01  SOX=6.270E+00  HC  =1.194E+01  CO =2.221E+01
GFL =1.841E-01  PFL  =1.593E-01  AMM=2.123E-02  HMET=8.736E-01  ALD=1.065E-08
DFG =8.706E+00  SFIDE=2.599E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     799.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.238E-03  CYAN =1.425E-03  O&G =1.153E-02  PHEN=2.673E-04  TSS =1.278E-01
SFIDE=2.852E-04  FLIDE=2.247E-02  TI  =0.0        ZN  =1.529E-03  NITR=9.028E-03
PB   =1.468E-04  MN   =0.0        COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =1.389E+00  BOD  =9.137E-03  HMET=5.503E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.635E+06  PET=7.029E+05  GAS=2.194E+06  ELEC=3.053E+06  HELEC=0.0
OTH =5.396E+05  TOT=8.156E+06
```

Table B.239 Medium Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.462E+07  PET=5.762E+06  GAS=2.308E+07  ELEC=2.542E+07  HELEC=1.474E+06
OTH =1.067E+06  TOT=7.229E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.924E+00  NOX =3.646E+01  SOX =1.120E+00  HC=2.881E-01  CO=4.270E+00
ALD =4.260E-01  DACD=1.078E-04  HMET=1.254E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    26354.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.829E-03  TSS=1.395E+00  SFIDE=1.423E-05  FLIDE=5.343E-04
TFE =9.305E-03  DFE=3.240E-03  ZN =8.039E-06  PB   =1.110E-05  MN   =3.088E-03
COD =2.228E+00  CU =0.0        TDS=4.675E+00  BOD  =1.391E+00  HMET =1.027E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=9.193E+00  NOX  =2.577E-01  SOX=7.110E+00  HC  =1.030E+01  CO =1.985E+01
GFL =1.660E-01  PFL  =1.437E-01  AMM=1.816E-02  HMET=2.560E-01  ALD=1.065E-08
ORG =7.414E+00  SFIDE=2.115E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      570.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.461E-03  CYAN =1.290E-03  O&G =1.035E-02  PHEN=2.399E-04  TSS =1.973E-01
SFIDE=2.549E-04  FLIDE=2.014E-02  TI  =0.0        ZN  =1.030E-03  NITR=8.141E-03
PB   =6.084E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.365E-01  BOD  =7.831E-03  HMET=6.319E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.152E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.416E+06  PET=4.074E+05  GAS=2.158E+06  ELEC=1.673E+06  HELEC=0.0
OTH =8.707E+03  TOT=6.241E+06
```

Table B.240 Large Auto - Otto Engine and Pb/Acid EHV Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.977E+07  PET=7.854E+06  GAS=2.981E+07  ELEC=3.466E+07  HELEC=1.939E+06
OTH =1.973E+06  TOT=9.647E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.030E+00  NOX =4.838E+01  SOX =1.468E+00  HC=3.867E-01  CO=5.636E+00
ALD =5.568E-01  DACD=1.519E-04  HMET=4.207E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   40583.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.853E-02  TSS=1.857E+00  SFIDE=7.477E-04  FLIDE=7.191E-04
TFE =1.233E-02  DFE=4.241E-03  ZN =2.904E-04  PB   =4.611E-04  MN   =4.093E-03
COD =2.912E+00  CU =0.0        TDS=6.120E+00  BOD  =1.794E+00  HMET =5.242E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.310E+01  NOX  =3.491E-01  SOX=7.239E+00  HC  =1.405E+01  CO =2.629E+01
GFL =2.185E-01  PFL  =1.890E-01  AMM=2.506E-02  HMET=9.854E-01  ALD=1.065E-08
ORG =1.028E+01  SFIDE=3.048E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     935.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.565E-03  CYAN =1.688E-03  O&G =1.365E-02  PHEN=3.165E-04  TSS =1.502E-01
SFIDE=3.375E-04  FLIDE=2.661E-02  TI  =0.0        ZN  =1.788E-03  NITR=1.069E-02
PB   =1.692E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.578E+00  BOD  =1.074E-02  HMET=6.454E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.840E+06  PET=7.913E+05  GAS=2.470E+06  ELEC=3.436E+06  HELEC=0.0
OTH =6.074E+05  TOT=9.181E+06
```

Table B.241 Large Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.678E+07  PET=6.655E+06  GAS=2.622E+07  ELEC=2.861E+07  HELEC=1.666E+06
OTH =1.161E+06  TOT=8.210E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.841E+00  NOX =4.200E+01  SOX =1.298E+00  HC=3.311E-01  CO=4.934E+00
ALD =4.948E-01  DACD=1.220E-04  HMET=1.426E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   30353.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.064E-03  TSS=1.618E+00  SFIDE=1.512E-05  FLIDE=6.207E-04
TFF =1.072E-02  DFE=3.746E-03  ZN =8.759E-06  PB   =1.197E-05  MN   =3.558E-03
COD =2.588E+00  CU =0.0        TDS=5.431E+00  BOD  =1.615E+00  HMET =1.173E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.050E+01  NOX  =2.989E-01  SOX=8.182E+00  HC  =1.191E+01  CO =2.287E+01
GFL =1.877E-01  PFL  =1.624E-01  AMM=2.068E-02  HMET=2.927E-01  ALD=1.065E-08
ORG =8.610E+00  SFIDE=2.405E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     653.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.443E-03  CYAN =1.492E-03  O&G =1.194E-02  PHEN=2.768E-04  TSS =2.261E-01
SFIDE=2.937E-04  FLIDE=2.310E-02  TI  =0.0        ZN  =1.189E-03  NITR=9.403E-03
PB   =7.011E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.703E-01  BOD  =9.066E-03  HMET=7.210E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.923E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.628E+06  PET=4.684E+05  GAS=2.481E+06  ELEC=1.924E+06  HELEC=0.0
OTH =1.001E+04  TOT=7.176E+06
```

Table B.242 Medium Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.678E+07  PET=7.968E+06  GAS=2.454E+07  ELEC=2.467E+07  HELEC=1.955E+06
OTH =1.023E+06  TOT=7.718E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.202E+00  NOX =4.398E+01  SOX =1.289E+00  HC=3.629E-01  CO=5.044E+00
ALD =4.840E-01  DACD=1.638E-04  HMET=3.905E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    36927.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.706E-02  TSS=1.626E+00  SFIDE=6.875E-04  FLIDE=6.260E-04
TFE =1.121E-02  DFE=3.699E-03  ZN =2.667E-04  PB   =4.237E-04  MN   =3.718E-03
COD =2.531E+00  CU =0.0        TDS=5.319E+00  BOD  =1.565E+00  HMET =4.439E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.111E+01  NOX  =3.046E-01  SOX=6.561E+00  HC  =1.237E+01  CO =2.390E+01
GFL =1.649E-01  PFL  =1.418E-01  AMM=2.561E-02  HMET=9.052E-01  ALD=1.065E-08
DRG =8.963E+00  SFIDE=2.903E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      822.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.788E-03  CYAN =1.470E-03  O&G =1.238E-02  PHEN=2.832E-04  TSS =1.393E-01
SFIDE=3.060E-04  FLIDE=2.319E-02  TI  =0.0        ZN  =1.626E-03  NITR=9.692E-03
PB   =1.543E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.444E+00  BOD  =9.400E-03  HMET=6.147E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.327E+06  PET=8.438E+05  GAS=2.686E+06  ELEC=3.112E+06  HELEC=0.0
OTH =5.710E+05  TOT=8.543E+06
```

Table B.243 Medium Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.422E+07  PET=6.654E+06  GAS=2.172E+07  ELEC=2.060E+07  HELEC=1.729E+06
OTH =3.962E+05  TOT=6.611E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.104E+00  NOX =3.829E+01  SOX =1.129E+00  HC=3.136E-01  CO=4.402E+00
ALD =4.246E-01  DACD=1.384E-04  HMET=1.351E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   27640.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.908E-03  TSS=1.400E+00  SFIDE=1.339E-05  FLIDE=5.325E-04
TFE =9.771E-03  DFE=3.250E-03  ZN =7.576E-06  PB   =1.050E-05  MN   =3.241E-03
COD =2.221E+00  CU =0.0        TDS=4.660E+00  BOD  =1.394E+00  HMET =1.044E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.935E+00  NOX  =2.572E-01  SOX=7.348E+00  HC  =1.038E+01  CO =2.084E+01
GFL =1.457E-01  PFL  =1.254E-01  AMM=2.185E-02  HMET=2.634E-01  ALD=1.065E-08
ORG =7.390E+00  SFIDE=2.342E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     572.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.787E-03  CYAN =1.292E-03  O&G =1.082E-02  PHEN=2.475E-04  TSS =2.084E-01
SFIDE=2.668E-04  FLIDE=2.029E-02  TI  =0.0        ZN  =1.073E-03  NITR=8.487E-03
PB   =6.302E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.405E-01  BOD  =7.833E-03  HMET=6.870E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =5.348E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.034E+06  PET=4.724E+05  GAS=2.588E+06  ELEC=1.843E+06  HELEC=0.0
OTH =6.491E+03  TOT=6.552E+06
```

Table B.244 Large Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.983E+07  PET=9.323E+06  GAS=2.893E+07  ELEC=2.931E+07  HELEC=2.351E+06
OTH =1.247E+06  TOT=9.129E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.449E+00  NOX =5.156E+01  SOX =1.487E+00  HC=4.289E-01  CO=5.872E+00
ALD =5.558E-01  DACD=2.005E-04  HMET=4.813E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   43700.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.123E-02  TSS=1.876E+00  SFIDE=8.588E-04  FLIDE=7.207E-04
TFE =1.315E-02  DFE=4.285E-03  ZN =3.329E-04  PB   =5.291E-04  MN   =4.359E-03
COD =2.906E+00  CU =0.0        TDS=6.108E+00  BOD  =1.800E+00  HMET =5.323E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.328E+01  NOX  =3.531E-01  SOX=7.925E+00  HC  =1.446E+01  CO =2.800E+01
GFL =1.982E-01  PFL  =1.705E-01  AMM=3.096E-02  HMET=1.130E+00  ALD=1.065E-08
ORG =1.035E+01  SFIDE=3.466E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      983.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =9.132E-03  CYAN =1.703E-03  O&G =1.446E-02  PHEN=3.305E-04  TSS =1.654E-01
SFIDE=3.585E-04  FLIDE=2.730E-02  TI  =0.0        ZN  =1.928E-03  NITR=1.128E-02
PB   =1.868E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.785E+00  BOD  =1.098E-02  HMET=7.339E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.655E+06  PET=1.053E+06  GAS=3.351E+06  ELEC=3.882E+06  HELEC=0.0
OTH =7.123E+05  TOT=1.066E+07
```

Table B.245 Large Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.651E+07  PET=7.689E+06  GAS=2.526E+07  ELEC=2.393E+07  HELEC=1.996E+06
OTH =4.575E+05  TOT=7.683E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.066E+00  NOX =4.399E+01  SOX =1.291E+00  HC=3.612E-01  CO=5.048E+00
ALD =4.852E-01  DACD=1.612E-04  HMET=1.616E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    31758.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.286E-03  TSS=1.601E+00  SFIDE=1.572E-05  FLIDE=6.084E-04
TFE =1.123E-02  DFE=3.720E-03  ZN =8.830E-06  PB   =1.227E-05  MN   =3.723E-03
COD =2.537E+00  CU =0.0        TDS=5.324E+00  BOD  =1.597E+00  HMET =1.282E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.039E+01  NOX  =2.957E-01  SOX=8.998E+00  HC  =1.201E+01  CO =2.393E+01
GFL =1.681E-01  PFL  =1.447E-01  AMM=2.534E-02  HMET=3.328E-01  ALD=1.065E-08
ORG =8.444E+00  SFIDE=2.735E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      661.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.798E-03  CYAN =1.479E-03  O&G =1.241E-02  PHEN=2.840E-04  TSS =2.529E-01
SFIDE=3.065E-04  FLIDE=2.332E-02  TI  =0.0        ZN  =1.230E-03  NITR=9.730E-03
PB   =7.229E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.809E-01  BOD  =9.077E-03  HMET=8.225E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =6.812E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.317E+06  PET=6.018E+05  GAS=3.297E+06  ELEC=2.347E+06  HELEC=0.0
OTH =8.268E+03  TOT=8.346E+06
```

Table B.246 Medium Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.424E+07  PET=7.324E+06  GAS=2.247E+07  ELEC=2.355E+07  HELEC=1.845E+06
OTH =7.599E+05  TOT=7.010E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.659E+00  NOX =4.146E+01  SOX =1.305E+00  HC=3.227E-01  CO=4.911E+00
ALD =4.998E-01  DACD=1.102E-04  HMET=2.398E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   32598.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=9.335E-03  TSS=1.643E+00  SFIDE=3.605E-04  FLIDE=6.368E-04
TFE =1.058E-02  DFE=3.758E-03  ZN =1.406E-04  PB   =2.225E-04  MN   =3.511E-03
COD =2.615E+00  CU =0.0        TDS=5.491E+00  BOD  =1.602E+00  HMET =4.491E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.062E+01  NOX  =3.013E-01  SOX=4.885E+00  HC  =1.175E+01  CO =2.263E+01
GFL =1.924E-01  PFL  =1.664E-01  AMM=1.927E-02  HMET=4.770E-01  ALD=1.065E-08
ORG =8.975E+00  SFIDE=2.408E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     732.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.342E-03  CYAN =1.497E-03  O&G =1.198E-02  PHEN=2.748E-04  TSS =1.216E-01
SFIDE=2.900E-04  FLIDE=2.310E-02  TI  =0.0        ZN  =1.414E-03  NITR=9.560E-03
PB   =1.132E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.531E-01  BOD  =8.945E-03  HMET=5.099E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=7.024E+05  PET=4.147E+05  GAS=1.354E+06  ELEC=1.630E+06  HELEC=0.0
OTH =2.971E+05  TOT=4.401E+06
```

Table B.247 Medium Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.123E+07  PET=5.572E+06  GAS=1.818E+07  ELEC=1.865E+07  HELEC=1.503E+06
OTH =3.570E+05  TOT=5.592E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.093E+00  NOX =3.093E+01  SOX =9.589E-01  HC=2.418E-01  CO=3.638E+00
ALD =3.657E-01  DACD=8.559E-05  HMET=1.122E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   22347.3
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.612E-03  TSS=1.196E+00  SFIDE=1.302E-05  FLIDE=4.587E-04
TFE =7.894E-03  DFE=2.785E-03  ZN =6.627E-06  PB   =9.204E-06  MN   =2.621E-03
COD =1.913E+00  CU =0.0        TDS=4.014E+00  BOD  =1.198E+00  HMET =9.251E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.277E+00  NOX  =2.228E-01  SOX=6.342E+00  HC  =8.948E+00  CO =1.688E+01
GFL =1.564E-01  PFL  =1.356E-01  AMM=1.476E-02  HMET=2.324E-01  ALD=1.065E-08
ORG =6.366E+00  SFIDE=1.888E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     505.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.481E-03  CYAN =1.109E-03  O&G =8.923E-03  PHEN=2.046E-04  TSS =1.773E-01
SFIDE=2.164E-04  FLIDE=1.760E-02  TI  =0.0        ZN  =8.957E-04  NITR=7.105E-03
PB   =4.679E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.964E-01  BOD  =6.833E-03  HMET=5.684E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =4.720E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.012E+06  PET=4.133E+05  GAS=2.144E+06  ELEC=1.671E+06  HELEC=0.0
OTH =5.250E+03  TOT=5.771E+06
```

Table B.248 Large Auto, Otto Engine and Pb/Acid EHV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.728E+07  PET=8.651E+06  GAS=2.706E+07  ELEC=2.942E+07  HELEC=2.278E+06
OTH =1.226E+06  TOT=8.581E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=7.841E+00  NOX =4.626E+01  SOX =1.410E+00  HC=3.664E-01  CO=5.401E+00
ALD =5.355E-01  DACD=1.379E-04  HMET=4.530E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    39648.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.032E-02  TSS=1.790E+00  SFIDE=8.274E-04  FLIDE=6.946E-04
TFE =1.179E-02  DFE=4.100E-03  ZN =3.200E-04  PB   =5.086E-04  MN   =3.914E-03
COD =2.801E+00  CU =0.0        TDS=5.887E+00  BOD  =1.729E+00  HMET =5.276E-05
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.359E+01  NOX  =3.417E-01  SOX=7.485E+00  HC  =1.389E+01  CO =2.521E+01
GFL =2.370E-01  PFL  =2.054E-01  AMM=2.315E-02  HMET=1.086E+00  ALD=1.065E-08
ORG =9.975E+00  SFIDE=3.084E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      960.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.190E-03  CYAN =1.632E-03  O&G =1.327E-02  PHEN=3.039E-04  TSS =1.508E-01
SFIDE=3.230E-04  FLIDE=2.636E-02  TI  =0.0        ZN  =1.812E-03  NITR=1.052E-02
PB   =1.773E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.713E+00  BOD  =1.068E-02  HMET=6.530E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.636E+06  PET=9.659E+05  GAS=3.154E+06  ELEC=3.796E+06  HELEC=0.0
OTH =6.920E+05  TOT=1.025E+07
```

Table B.249 Large Auto, Otto Engine and Ni/Zn EHV Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.445E+07  PET=7.145E+06  GAS=2.341E+07  ELEC=2.398E+07  HELEC=1.921E+06
OTH =4.562E+05  TOT=7.197E+07
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=6.537E+00  NOX =3.941E+01  SOX =1.220E+00  HC=3.084E-01  CO=4.631E+00
ALD =4.649E-01  DACD=1.099E-04  HMET=1.478E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=   28473.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.123E-03  TSS=1.521E+00  SFIDE=1.669E-05  FLIDE=5.832E-04
TFE =1.006E-02  DFE=3.543E-03  ZN =8.478E-06  PB   =1.179E-05  MN   =3.339E-03
COD =2.432E+00  CU =0.0        TDS=5.103E+00  BOD  =1.526E+00  HMET =1.244E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.065E+01  NOX  =2.847E-01  SOX=8.529E+00  HC  =1.149E+01  CO =2.151E+01
GFL =1.998E-01  PFL  =1.732E-01  AMM=1.890E-02  HMET=3.201E-01  ALD=1.065E-08
ORG =8.094E+00  SFIDE=2.435E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=      646.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.984E-03  CYAN =1.411E-03  O&G =1.136E-02  PHEN=2.605E-04  TSS =2.365E-01
SFIDE=2.757E-04  FLIDE=2.244E-02  TI  =0.0        ZN  =1.144E-03  NITR=9.045E-03
PB   =6.734E-05  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.672E-01  BOD  =8.785E-03  HMET=7.498E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =6.551E+00
TOTAL BATTERY BTU BY FUEL TYPE
COAL=1.404E+06  PET=5.735E+05  GAS=2.975E+06  ELEC=2.320E+06  HELEC=0.0
OTH =7.286E+03  TOT=8.009E+06
```

Table B.250 AGT, Group Rapid Transit Vehicle, Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=6.410E+07  PET=3.422E+07  GAS=7.719E+07  ELEC=4.904E+07  HELEC=8.594E+05
OTH =5.498E+05  TOT=2.270E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.416E+01  NOX =1.529E+02  SOX =1.009E+00  HC=1.293E+00  CO=1.153E+01
ALD =7.410E-03  DACD=9.171E-04  HMET=7.231E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  109449.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.419E-02  TSS=1.020E+00  SFIDE=0.0        FLIDE=3.795E-03
TFE =4.540E-02  DFE=2.624E-02  ZN =0.0        PB   =0.0        MN   =1.299E-02
COD =0.0        CU =0.0        TDS=2.930E+01  BOD  =4.860E-01  HMET =3.392E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.040E+01  NOX  =1.397E+00  SOX=1.370E+01  HC  =5.979E+01  CO =8.330E+01
GFL =7.980E-02  PFL  =5.316E-02  AMM=1.269E-01  HMET=0.0        ALD=1.065E-08
ORG =8.749E+00  SFIDE=1.865E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     1754.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.089E-01  CYAN =7.125E-02  O&G =9.342E-02  PHEN=1.109E-02  TSS =1.344E+00
SFIDE=6.752E-04  FLIDE=7.978E-02  TI  =0.0        ZN  =3.489E-03  NITR=2.791E-02
PB   =1.938E-04  MN   =0.0        COD =5.392E-02  AL  =7.662E-03  CU  =2.189E-05
TDS  =4.221E+00  BOD  =1.637E-01  HMET=3.947E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.251 AGT, Group Rapid Transit Vehicle, Energy and Residuals 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.504E+07  PET=2.860E+07  GAS=7.061E+07  ELEC=4.472E+07  HELEC=7.969E+05
OTH =5.382E+05  TOT=2.012E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.343E+01  NOX =1.438E+02  SOX =9.493E-01  HC=1.175E+00  CO=1.085E+01
ALD =6.970E-03  DACD=7.829E-04  HMET=7.194E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  102947.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=5.397E-02  TSS=9.618E-01  SFIDE=0.0        FLIDE=3.780E-03
TFE =4.269E-02  DFE=2.468E-02  ZN =0.0        PB   =0.0        MN   =1.223E-02
COD =0.0        CU =0.0        TDS=2.918E+01  BOD  =4.835E-01  HMET =3.377E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.967E+01  NOX  =1.392E+00  SOX=1.327E+01  HC  =5.919E+01  CO =7.914E+01
GFL =8.661E-02  PFL  =5.870E-02  AMM=1.106E-01  HMET=0.0        ALD=1.065E-08
ORG =8.715E+00  SFIDE=1.855E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    1721.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.845E-01  CYAN =6.705E-02  O&G =9.202E-02  PHEN=1.048E-02  TSS =1.368E+00
SFIDE=6.725E-04  FLIDE=8.513E-02  TI  =0.0        ZN  =3.557E-03  NITR=2.846E-02
PB   =1.976E-04  MN   =0.0        COD =5.910E-02  AL  =1.213E-02  CU  =3.465E-05
TDS  =4.205E+00  BOD  =1.630E-01  HMET=3.927E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.252 AGT, Group Rapid Transit Vehicle, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.423E+07  PET=2.413E+07  GAS=6.425E+07  ELEC=4.355E+07  HELEC=5.391E+05
OTH =5.211E+05  TOT=1.887E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.267E+01  NOX =1.352E+02  SOX =8.926E-01  HC=1.100E+00  CO=1.020E+01
ALD =6.553E-03  DACD=7.270E-04  HMET=6.884E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=    96794.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.779E-03  TSS=7.229E-01  SFIDE=0.0        FLIDE=2.556E-03
TFE =3.439E-02  DFE=1.016E-02  ZN =0.0        PB   =0.0        MN   =1.150E-02
COD =0.0        CU =0.0        TDS=0.0        BOD  =4.401E-01  HMET =1.356E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.846E+01  NOX  =1.317E+00  SOX=1.252E+01  HC  =5.599E+01  CO =7.444E+01
GFL =7.928E-02  PFL  =5.323E-02  AMM=1.030E-01  HMET=0.0        ALD=1.065E-08
ORG =8.250E+00  SFIDE=1.775E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     1623.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.415E-02  CYAN =4.023E-03  O&G =3.624E-02  PHEN=8.399E-04  TSS =6.817E-01
SFIDE=9.416E-04  FLIDE=5.810E-02  TI  =0.0        ZN  =3.357E-03  NITR=2.686E-02
PB   =1.865E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.171E+00  BOD  =4.495E-02  HMET=3.758E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.253 AGT, Shuttle Loop Transit, Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.801E+08  PET=1.013E+08  GAS=2.310E+08  ELEC=1.398E+08  HELEC=1.610E+06
OTH =1.382E+06  TOT=6.571E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=4.059E+01  NOX =4.448E+02  SOX =2.936E+00  HC=3.625E+00  CO=3.354E+01
ALD =2.156E-02  DACD=2.407E-03  HMET=1.897E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  318361.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.643E-01  TSS=2.962E+00  SFIDE=0.0        FLIDE=1.174E-02
TFE =1.320E-01  DFE=7.633E-02  ZN =0.0        PB   =0.0        MN   =3.783E-02
COD =0.0        CU =0.0        TDS=9.066E+01  BOD  =1.286E+00  HMET =9.824E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.850E+01  NOX  =4.323E+00  SOX=4.112E+01  HC  =1.838E+02  CO =2.432E+02
GFL =1.725E-01  PFL  =1.001E-01  AMM=3.404E-01  HMET=0.0        ALD=1.065E-08
ORG =2.707E+01  SFIDE=4.892E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5035.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.189E+00  CYAN =2.074E-01  O&G =2.813E-01  PHEN=3.244E-02  TSS =3.711E+00
SFIDE=2.086E-03  FLIDE=2.010E-01  TI  =0.0        ZN  =1.057E-02  NITR=8.454E-02
PB   =5.871E-04  MN   =0.0        COD =1.556E-01  AL  =1.435E-02  CU  =4.101E-05
TDS  =1.289E+01  BOD  =5.065E-01  HMET=1.036E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.254 AGT, Shuttle Loop Transit, Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.487E+08  PET=8.300E+07  GAS=2.049E+08  ELEC=1.221E+08  HELEC=1.433E+06
OTH =1.344E+06  TOT=5.631E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.767E+01  NOX =4.099E+02  SOX =2.707E+00  HC=3.249E+00  CO=3.091E+01
ALD =1.987E-02  DACD=2.042E-03  HMET=1.837E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  293418.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.581E-01  TSS=2.736E+00  SFIDE=0.0        FLIDE=1.129E-02
TFE =1.217E-01  DFE=7.035E-02  ZN =0.0        PB   =0.0        MN   =3.489E-02
COD =0.0        CU =0.0        TDS=8.716E+01  BOD  =1.245E+00  HMET =9.472E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.484E+01  NOX  =4.156E+00  SOX=3.873E+01  HC  =1.759E+02  CO =2.262E+02
GFL =1.790E-01  PFL  =1.062E-01  AMM=2.942E-01  HMET=0.0        ALD=1.065E-08
ORG =2.603E+01  SFIDE=4.738E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    4803.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.096E+00  CYAN =1.912E-01  O&G =2.689E-01  PHEN=3.002E-02  TSS =3.633E+00
SFIDE=2.006E-03  FLIDE=2.033E-01  TI  =0.0        ZN  =1.041E-02  NITR=8.325E-02
PB   =5.781E-04  MN   =0.0        COD =1.592E-01  AL  =2.181E-02  CU  =6.230E-05
TDS  =1.240E+01  BOD  =4.869E-01  HMET=1.003E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.255 AGT, Shuttle Loop Transit, Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.485E+08  PET=7.145E+07  GAS=1.901E+08  ELEC=1.207E+08  HELEC=1.008E+06
OTH =1.335E+06  TOT=5.369E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.614E+01  NOX =3.925E+02  SOX =2.592E+00  HC=3.106E+00  CO=2.960E+01
ALD =1.902E-02  DACD=1.945E-03  HMET=1.785E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  280951.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.758E-02  TSS=2.091E+00  SFIDE=0.0        FLIDE=7.740E-03
TFE =9.981E-02  DFE=3.050E-02  ZN =0.0        PB   =0.0        MN   =3.341E-02
COD =0.0        CU =0.0        TDS=0.0        BOD  =1.142E+00  HMET =3.516E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.249E+01  NOX  =3.989E+00  SOX=3.713E+01  HC  =1.688E+02  CO =2.166E+02
GFL =1.697E-01  PFL  =1.001E-01  AMM=2.806E-01  HMET=0.0        ALD=1.065E-08
ORG =2.498E+01  SFIDE=4.604E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     4611.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.010E-02  CYAN =1.209E-02  O&G =1.066E-01  PHEN=2.468E-03  TSS =1.820E+00
SFIDE=2.739E-03  FLIDE=1.676E-01  TI  =0.0        ZN  =9.977E-03  NITR=7.982E-02
PB   =5.543E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =3.393E+00  BOD  =1.361E-01  HMET=9.747E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.256 Small Bus, Diesel Engine Energy and Residuals, 1980 All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=7.498E+07  PET=2.697E+07  GAS=9.191E+07  ELEC=8.719E+07  HELEC=9.738E+06
OTH =5.812E+05  TOT=2.914E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.966E+01  NOX =2.454E+02  SOX =1.617E+00  HC=1.642E+00  CO=1.850E+01
ALD =1.183E-02  DACD=6.459E-04  HMET=1.025E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  176007.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.277E-02  TSS=1.591E+00  SFIDE=2.674E-05  FLIDE=6.769E-03
TFE =7.287E-02  DFE=4.214E-02  ZN =1.852E-05  PB   =2.900E-05  MN   =2.098E-02
COD =0.0        CU =0.0        TDS=1.926E+01  BOD  =7.013E-02  HMET =1.461E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.576E+01  NOX  =1.744E+00  SOX=1.731E+01  HC  =4.557E+01  CO =1.347E+02
GFL =7.036E-01  PFL  =5.955E-01  AMM=1.131E-01  HMET=5.459E-02  ALD=1.065E-08
ORG =1.621E+01  SFIDE=2.203E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    3129.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.556E-01  CYAN =1.147E-01  O&G =1.316E-01  PHEN=1.805E-02  TSS =2.113E+00
SFIDE=1.469E-03  FLIDE=5.094E-01  TI  =0.0        ZN  =6.947E-03  NITR=5.536E-02
PB   =3.897E-04  MN   =0.0        COD =1.840E-01  AL  =8.682E-02  CU  =2.481E-04
TDS  =2.649E+00  BOD  =1.112E-01  HMET=4.679E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.257 Small Bus, Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.488E+07  PET=2.595E+07  GAS=9.301E+07  ELEC=8.544E+07  HELEC=1.009E+07
OTH =5.635E+05  TOT=2.700E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.751E+01  NOX =2.182E+02  SOX =1.439E+00  HC=1.369E+00  CO=1.645E+01
ALD =1.052E-02  DACD=3.991E-04  HMET=1.001E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  156518.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.898E-02  TSS=1.419E+00  SFIDE=2.975E-05  FLIDE=6.608E-03
TFF =6.479E-02  DFE=3.747E-02  ZN =1.707E-05  PB   =2.673E-05  MN   =1.868E-02
COD =0.0        CU =0.0        TDS=2.318E+01  BOD  =7.261E-02  HMET =1.723E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.711E+01  NOX  =1.801E+00  SOX=1.673E+01  HC  =5.151E+01  CO =1.204E+02
GFL =8.583E-01  PFL  =7.335E-01  AMM=8.114E-02  HMET=5.070E-02  ALD=1.065E-08
ORG =1.583E+01  SFIDE=2.175E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    3059.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.827E-01  CYAN =1.021E-01  O&G =1.266E-01  PHEN=1.620E-02  TSS =2.722E+00
SFIDE=1.389E-03  FLIDE=6.200E-01  TI  =0.0        ZN  =6.532E-03  NITR=5.205E-02
PB   =3.663E-04  MN   =0.0        COD =2.621E-01  AL  =1.535E-01  CU  =4.385E-04
TDS  =3.158E+00  BOD  =1.326E-01  HMET=4.625E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.258 Small Bus, Diesel Engine, Energy and Residuals
1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.894E+08  PET=2.347E+08  GAS=8.090E+08  ELEC=7.656E+08  HELEC=5.847E+07
OTH =5.254E+06  TOT=2.463E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.786E+02  NOX =2.234E+03  SOX =1.472E+01  HC=1.385E+01  CO=1.683E+02
ALD =1.077E-01  DACD=3.779E-03  HMET=8.204E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1599093.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.843E-03  TSS=1.156E+01  SFIDE=3.030E-05  FLIDE=4.835E-02
TFE =5.675E-01  DFE=2.184E-01  ZN =1.542E-05  PB   =2.460E-05  MN   =1.912E-01
COD =0.0        CU =0.0        TDS=3.636E-04  BOD  =5.143E-01  HMET =1.584E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.905E+02  NOX  =1.741E+01  SOX=1.613E+02  HC  =4.451E+02  CO =1.234E+03
GFL =5.099E+00  PFL  =4.238E+00  AMM=7.970E-01  HMET=5.164E-02  ALD=1.065E-08
ORG =1.616E+02  SFIDE=2.074E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   27976.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.993E-01  CYAN =8.714E-02  O&G =6.658E-01  PHEN=1.535E-02  TSS =2.997E+00
SFIDE=1.585E-02  FLIDE=1.108E+00  TI  =0.0        ZN  =6.775E-02  NITR=5.418E-01
PB   =3.768E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =6.166E+00  BOD  =3.124E-01  HMET=4.407E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.259 Small Bus, Diesel Engine, Energy and Residuals
1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=7.191E+07  PET=2.560E+07  GAS=9.313E+07  ELEC=8.733E+07  HELEC=1.024E+07
OTH =4.926E+05  TOT=2.887E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.988E+01  NOX =2.482E+02  SOX =1.635E+00  HC=1.679E+00  CO=1.871E+01
ALD =1.196E-02  OACD=6.888E-04  HMET=1.025E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  177997.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.277E-02  TSS=1.609E+00  SFIDE=2.674E-05  FLIDE=6.769E-03
TFE =7.370E-02  DFE=4.262E-02  ZN =1.852E-05  PB   =2.900E-05  MN   =2.121E-02
COD =0.0        CU =0.0        TDS=1.926E+01  BOD  =7.013E-02  HMET =1.461E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.910E+01  NOX  =1.744E+00  SOX=1.743E+01  HC  =4.569E+01  CO =1.359E+02
GFL =8.399E-01  PFL  =7.166E-01  AMM=1.183E-01  HMET=5.459E-02  ALD=1.065E-08
ORG =1.621E+01  SFIDE=2.203E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    3260.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.630E-01  CYAN =1.160E-01  O&G =1.317E-01  PHEN=1.824E-02  TSS =2.080E+00
SFIDE=1.469E-03  FLIDE=5.791E-01  TI  =0.0        ZN  =6.892E-03  NITR=5.492E-02
PB   =3.866E-04  MN   =0.0        COD =1.590E-01  AL  =6.606E-02  CU  =1.887E-04
TDS  =2.649E+00  BOD  =1.112E-01  HMET=4.679E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.260 Small Bus, Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.406E+07  PET=2.446E+07  GAS=9.136E+07  ELEC=8.641E+07  HELEC=7.921E+06
OTH =5.519E+05  TOT=2.657E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.642E+01  NOX =2.046E+02  SOX =1.348E+00  HC=1.277E+00  CO=1.542E+01
ALD =9.792E-03  OACD=3.534E-04  HMET=9.855E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  146753.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.736E-03  TSS=1.056E+00  SFIDE=2.975E-05  FLIDE=3.390E-03
TFE =5.198E-02  DFE=1.992E-02  ZN =1.546E-05  PB   =2.467E-05  MN   =1.751E-02
COD =0.0        CU =0.0        TDS=3.570E-04  BOD  =5.271E-02  HMET =1.624E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.618E+01  NOX  =1.513E+00  SOX=1.584E+01  HC  =5.478E+01  CO =1.130E+02
GFL =8.936E-01  PFL  =7.720E-01  AMM=7.447E-02  HMET=5.175E-02  ALD=1.065E-08
ORG =1.506E+01  SFIDE=2.126E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    2963.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.658E-02  CYAN =7.948E-03  O&G =6.062E-02  PHEN=1.404E-03  TSS =2.954E-01
SFIDE=1.452E-03  FLIDE=1.137E-01  TI  =0.0        ZN  =6.144E-03  NITR=4.896E-02
PB   =3.450E-04  MN   =0.0        COD =1.765E-07  AL  =0.0         CU  =0.0
TDS  =8.616E-01  BOD  =4.118E-02  HMET=4.523E-02  MO  =0.0         ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.261 Small Bus, Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=5.387E+07  PET=2.800E+07  GAS=9.396E+07  ELEC=8.636E+07  HELEC=7.013E+06
OTH =6.019E+05  TOT=2.686E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.724E+01  NOX =2.149E+02  SOX =1.416E+00  HC=1.328E+00  CO=1.620E+01
ALD =1.028E-02  DACD=3.466E-04  HMET=9.909E-03
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  154114.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.632E-03  TSS=1.109E+00  SFIDE=2.550E-05  FLIDE=3.570E-03
TFE =5.461E-02  DFE=2.108E-02  ZN =1.325E-05  PB   =2.115E-05  MN   =1.840E-02
COD =0.0        CU =0.0        TDS=3.060E-04  BOD  =5.452E-02  HMET =1.680E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.375E+01  NOX  =1.566E+00  SOX=1.640E+01  HC  =5.552E+01  CO =1.189E+02
GFL =7.376E-01  PFL  =6.324E-01  AMM=7.554E-02  HMET=4.436E-02  ALD=1.065E-08
ORG =1.595E+01  SFIDE=2.199E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    2941.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.843E-02  CYAN =8.412E-03  O&G =6.425E-02  PHEN=1.479E-03  TSS =3.067E-01
SFIDE=1.526E-03  FLIDE=1.140E-01  TI  =0.0        ZN  =6.551E-03  NITR=5.224E-02
PB   =3.670E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.578E-01  BOD  =4.144E-02  HMET=4.678E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.262 Small Bus, Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=7.114E+07  PET=2.532E+07  GAS=9.016E+07  ELEC=8.284E+07  HELEC=9.440E+06
OTH =4.630E+05  TOT=2.794E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.985E+01  NOX =2.478E+02  SOX =1.632E+00  HC=1.665E+00  CO=1.868E+01
ALD =1.194E-02  OACD=6.653E-04  HMET=1.023E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  177666.7
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.278E-02  TSS=1.606E+00  SFIDE=2.852E-05  FLIDE=6.769E-03
TFE =7.358E-02  DFE=4.255E-02  ZN =1.625E-05  PB   =2.545E-05  MN   =2.118E-02
COD =0.0        CU =0.0        TDS=1.933E+01  BOD  =7.139E-02  HMET =1.470E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.956E+01  NOX  =1.746E+00  SOX=1.741E+01  HC  =4.579E+01  CO =1.358E+02
GFL =8.610E-01  PFL  =7.353E-01  AMM=1.157E-01  HMET=4.829E-02  ALD=1.065E-08
ORG =1.621E+01  SFIDE=2.251E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    3282.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =6.619E-01  CYAN =1.159E-01  O&G =1.319E-01  PHEN=1.821E-02  TSS =2.114E+00
SFIDE=1.477E-03  FLIDE=5.923E-01  TI  =0.0        ZN  =6.916E-03  NITR=5.514E-02
PB   =3.875E-04  MN   =0.0        COD =1.611E-01  AL  =6.779E-02  CU  =1.937E-04
TDS  =2.650E+00  BOD  =1.116E-01  HMET=4.782E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.263 Medium Bus, Diesel Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.498E+08  PET=4.098E+07  GAS=1.436E+08  ELEC=1.670E+08  HELEC=1.653E+07
OTH =7.839E+05  TOT=5.188E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.755E+01  NOX =4.693E+02  SOX =3.088E+00  HC=2.789E+00  CO=3.536E+01
ALD =2.251E-02  DACD=5.599E-04  HMET=1.833E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  336402.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.251E-02  TSS=3.034E+00  SFIDE=4.170E-05  FLIDE=1.254E-02
TFE =1.393E-01  DFE=8.057E-02  ZN =2.888E-05  PB   =4.523E-05  MN   =4.022E-02
COD =0.0        CU =0.0        TDS=1.831E+01  BOD  =1.149E-01  HMET =1.538E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.309E+01  NOX  =2.853E+00  SOX=2.947E+01  HC  =5.353E+01  CO =2.593E+02
GFL =1.196E+00  PFL  =1.010E+00  AMM=1.426E-01  HMET=8.514E-02  ALD=1.065E-08
ORG =3.838E+01  SFIDE=4.038E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     6019.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.253E+00  CYAN =2.197E-01  O&G =2.410E-01  PHEN=3.452E-02  TSS =3.624E+00
SFIDE=3.122E-03  FLIDE=9.025E-01  TI  =0.0        ZN  =1.435E-02  NITR=1.144E-01
PB   =8.028E-04  MN   =0.0        COD =3.246E-01  AL  =1.474E-01  CU  =4.211E-04
TDS  =2.603E+00  BOD  =1.110E-01  HMET=8.559E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.264 Medium Bus, Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.069E+08  PET=3.278E+07  GAS=1.178E+08  ELEC=1.349E+08  HELEC=1.148E+07
OTH =7.185E+05  TOT=4.046E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.484E+01  NOX =4.353E+02  SOX =2.865E+00  HC=2.545E+00  CO=3.280E+01
ALD =2.088E-02  DACD=4.369E-04  HMET=1.716E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  312062.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.241E-02  TSS=2.815E+00  SFIDE=4.462E-05  FLIDE=1.173E-02
TFE =1.293E-01  DFE=7.475E-02  ZN =2.560E-05  PB   =4.009E-05  MN   =3.732E-02
COD =0.0        CU =0.0        TDS=1.841E+01  BOD  =1.095E-01  HMET =1.528E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.475E+01  NOX  =2.700E+00  SOX=2.764E+01  HC  =5.225E+01  CO =2.409E+02
GFL =9.949E-01  PFL  =8.349E-01  AMM=1.233E-01  HMET=7.605E-02  ALD=1.065E-08
ORG =3.591E+01  SFIDE=3.816E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5513.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.162E+00  CYAN =2.038E-01  O&G =2.269E-01  PHEN=3.205E-02  TSS =3.567E+00
SFIDE=2.935E-03  FLIDE=7.890E-01  TI  =0.0        ZN  =1.351E-02  NITR=1.078E-01
PB   =7.559E-04  MN   =0.0        COD =3.479E-01  AL  =1.747E-01  CU  =4.992E-04
TDS  =2.599E+00  BOD  =1.109E-01  HMET=8.090E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.265 Medium Bus, Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.291E+08  PET=3.557E+07  GAS=1.308E+08  ELEC=1.567E+08  HELEC=1.045E+07
OTH =8.909E+05  TOT=4.635E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.870E+01  NOX =4.837E+02  SOX =3.183E+00  HC=2.809E+00  CO=3.645E+01
ALD =2.319E-02  DACD=4.501E-04  HMET=1.864E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  346743.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.026E-03  TSS=2.499E+00  SFIDE=4.726E-05  FLIDE=9.155E-03
TFE =1.229E-01  DFE=4.950E-02  ZN =2.404E-05  PB   =3.836E-05  MN   =4.148E-02
COD =0.0        CU =0.0        TDS=5.671E-04  BOD  =1.032E-01  HMET =3.178E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.846E+01  NOX  =2.923E+00  SOX=3.031E+01  HC  =5.501E+01  CO =2.679E+02
GFL =9.124E-01  PFL  =7.571E-01  AMM=1.332E-01  HMET=8.054E-02  ALD=1.065E-08
ORG =3.923E+01  SFIDE=4.161E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     5968.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.651E-02  CYAN =1.978E-02  O&G =1.464E-01  PHEN=3.390E-03  TSS =6.238E-01
SFIDE=3.447E-03  FLIDE=2.361E-01  TI  =0.0        ZN  =1.514E-02  NITR=1.208E-01
PB   =8.467E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.480E-01  BOD  =3.056E-02  HMET=8.820E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.266 Medium us, Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.370E+08  PET=3.628E+07  GAS=1.381E+08  ELEC=1.584E+08  HELEC=1.662E+07
OTH =6.509E+05  TOT=4.870E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.615E+01  NOX =4.519E+02  SOX =2.973E+00  HC=2.709E+00  CO=3.405E+01
ALD =2.168E-02  DACD=5.840E-04  HMET=1.767E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  323947.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.113E-02  TSS=2.921E+00  SFIDE=4.170E-05  FLIDE=1.198E-02
TFE =1.342E-01  DFE=7.759E-02  ZN =2.888E-05  PB   =4.523E-05  MN   =3.872E-02
COD =0.0        CU =0.0        TDS=1.750E+01  BOD  =1.100E-01  HMET =1.470E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.475E+01  NOX  =2.725E+00  SOX=2.833E+01  HC  =5.130E+01  CO =2.494E+02
GFL =1.365E+00  PFL  =1.163E+00  AMM=1.423E-01  HMET=8.514E-02  ALD=1.065E-08
ORG =3.667E+01  SFIDE=3.867E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5970.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.206E+00  CYAN =2.115E-01  O&G =2.308E-01  PHEN=3.321E-02  TSS =3.412E+00
SFIDE=2.985E-03  FLIDE=9.761E-01  TI  =0.0        ZN  =1.368E-02  NITR=1.091E-01
PB   =7.659E-04  MN   =0.0        COD =2.698E-01  AL  =1.072E-01  CU  =3.063E-04
TDS  =2.493E+00  BOD  =1.061E-01  HMET=8.198E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.267 Medium Bus, Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.084E+08  PET=2.921E+07  GAS=1.122E+08  ELEC=1.368E+08  HELEC=8.670E+06
OTH =7.173E+05  TOT=3.966E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.457E+01  NOX =4.319E+02  SOX =2.843E+00  HC=2.499E+00  CO=3.255E+01
ALD =2.072E-02  OACD=3.853E-04  HMET=1.728E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  309604.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.796E-03  TSS=2.232E+00  SFIDE=4.250E-05  FLIDE=8.400E-03
TFE =1.097E-01  DFE=4.431E-02  ZN =2.209E-05  PB   =3.525E-05  MN   =3.703E-02
COD =0.0        CU =0.0        TDS=5.100E-04  BOD  =9.579E-02  HMET =2.951E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.469E+01  NOX  =2.707E+00  SOX=2.750E+01  HC  =5.227E+01  CO =2.391E+02
GFL =1.006E+00  PFL  =8.450E-01  AMM=1.170E-01  HMET=7.393E-02  ALD=1.065E-08
ORG =3.599E+01  SFIDE=3.864E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     5499.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.724E-02  CYAN =1.770E-02  O&G =1.304E-01  PHEN=3.030E-03  TSS =5.661E-01
SFIDE=3.078E-03  FLIDE=2.161E-01  TI  =0.0        ZN  =1.347E-02  NITR=1.075E-01
PB   =7.536E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.251E-01  BOD  =3.011E-02  HMET=8.191E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.268 Medium Bus, Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.193E+08  PET=3.499E+07  GAS=1.261E+08  ELEC=1.569E+08  HELEC=8.675E+06
OTH =8.657E+05  TOT=4.455E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.924E+01  NOX =4.905E+02  SOX =3.228E+00  HC=2.825E+00  CO=3.696E+01
ALD =2.351E-02  OACD=4.118E-04  HMET=1.921E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  351567.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.095E-03  TSS=2.534E+00  SFIDE=4.675E-05  FLIDE=9.360E-03
TFE =1.246E-01  DFE=5.046E-02  ZN =2.430E-05  PB   =3.877E-05  MN   =4.206E-02
COD =0.0        CU =0.0        TDS=5.610E-04  BOD  =1.066E-01  HMET =3.285E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.002E+01  NOX  =2.989E+00  SOX=3.081E+01  HC  =5.617E+01  CO =2.717E+02
GFL =9.416E-01  PFL  =7.822E-01  AMM=1.301E-01  HMET=8.132E-02  ALD=1.065E-08
ORG =4.011E+01  SFIDE=4.301E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    6076.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.772E-02  CYAN =2.017E-02  O&G =1.487E-01  PHEN=3.446E-03  TSS =6.370E-01
SFIDE=3.496E-03  FLIDE=2.400E-01  TI  =0.0        ZN  =1.540E-02  NITR=1.229E-01
PB   =8.614E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.661E-01  BOD  =3.134E-02  HMET=9.117E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.269 Medium Bus, Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.353E+08  PET=3.562E+07  GAS=1.325E+08  ELEC=1.494E+08  HELEC=1.530E+07
OTH =6.489E+05  TOT=4.687E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.610E+01  NOX =4.512E+02  SOX =2.969E+00  HC=2.686E+00  CO=3.400E+01
ALD =2.164E-02  DACD=5.475E-04  HMET=1.763E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  323432.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.115E-02  TSS=2.917E+00  SFIDE=4.448E-05  FLIDE=1.198E-02
TFE =1.340E-01  DFE=7.748E-02  ZN =2.534E-05  PB   =3.969E-05  MN   =3.867E-02
COD =0.0        CU =0.0        TDS=1.761E+01  BOD  =1.120E-01  HMET =1.483E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.547E+01  NOX  =2.729E+00  SOX=2.830E+01  HC  =5.147E+01  CO =2.492E+02
GFL =1.398E+00  PFL  =1.192E+00  AMM=1.382E-01  HMET=7.531E-02  ALD=1.065E-08
ORG =3.667E+01  SFIDE=3.943E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     6003.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.205E+00  CYAN =2.112E-01  O&G =2.311E-01  PHEN=3.317E-02  TSS =3.464E+00
SFIDE=2.998E-03  FLIDE=9.967E-01  TI  =0.0        ZN  =1.372E-02  NITR=1.094E-01
PB   =7.672E-04  MN   =0.0        COD =2.730E-01  AL  =1.099E-01  CU  =3.140E-04
TDS  =2.494E+00  BOD  =1.067E-01  HMET=8.358E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.270 Large Bus, Diesel Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.251E+08  PET=6.219E+07  GAS=2.175E+08  ELEC=2.530E+08  HELEC=2.510E+07
OTH =1.080E+06  TOT=7.840E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.606E+01  NOX =7.011E+02  SOX =4.614E+00  HC=4.086E+00  CO=5.283E+01
ALD =3.363E-02  DACD=6.834E-04  HMET=2.611E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  502327.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.869E-02  TSS=4.532E+00  SFIDE=4.170E-05  FLIDE=1.915E-02
TFE =2.082E-01  DFE=1.204E-01  ZN =2.888E-05  PB   =4.523E-05  MN   =6.010E-02
COD =0.0        CU =0.0        TDS=2.791E+01  BOD  =1.724E-01  HMET =2.336E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.249E+02  NOX  =4.353E+00  SOX=4.415E+01  HC  =8.097E+01  CO =3.878E+02
GFL =1.816E+00  PFL  =1.534E+00  AMM=1.962E-01  HMET=8.514E-02  ALD=1.065E-08
ORG =5.856E+01  SFIDE=6.046E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    9050.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.872E+00  CYAN =3.283E-01  O&G =3.628E-01  PHEN=5.168E-02  TSS =5.481E+00
SFIDE=4.737E-03  FLIDE=1.370E+00  TI  =0.0        ZN  =2.166E-02  NITR=1.729E-01
PB   =1.209E-03  MN   =0.0        COD =4.941E-01  AL  =2.237E-01  CU  =6.393E-04
TDS  =3.904E+00  BOD  =1.692E-01  HMET=1.282E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.271 Large Bus, Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.661E+08  PET=5.022E+07  GAS=1.797E+08  ELEC=2.082E+08  HELEC=1.725E+07
OTH =1.023E+06  TOT=6.227E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.412E+01  NOX =6.768E+02  SOX =4.454E+00  HC=3.898E+00  CO=5.100E+01
ALD =3.247E-02  DACD=5.693E-04  HMET=2.545E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  484943.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.735E-02  TSS=4.376E+00  SFIDE=4.726E-05  FLIDE=1.859E-02
TFE =2.010E-01  DFE=1.162E-01  ZN =2.711E-05  PB   =4.246E-05  MN   =5.804E-02
COD =0.0        CU =0.0        TDS=2.717E+01  BOD  =1.686E-01  HMET =2.276E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.150E+02  NOX  =4.230E+00  SOX=4.270E+01  HC  =7.858E+01  CO =3.748E+02
GFL =1.499E+00  PFL  =1.255E+00  AMM=1.794E-01  HMET=8.054E-02  ALD=1.065E-08
ORG =5.687E+01  SFIDE=5.916E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    8543.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.807E+00  CYAN =3.170E-01  O&G =3.526E-01  PHEN=4.992E-02  TSS =5.428E+00
SFIDE=4.615E-03  FLIDE=1.198E+00  TI  =0.0        ZN  =2.115E-02  NITR=1.688E-01
PB   =1.180E-03  MN   =0.0        COD =5.342E-01  AL  =2.626E-01  CU  =7.502E-04
TDS  =3.797E+00  BOD  =1.647E-01  HMET=1.254E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.272 Large Bus - Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.805E+08  PET=5.092E+07  GAS=1.863E+08  ELEC=2.221E+08  HELEC=1.501E+07
OTH =1.169E+06  TOT=6.561E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.389E+01  NOX =6.739E+02  SOX =4.435E+00  HC=3.859E+00  CO=5.078E+01
ALD =3.232E-02  DACD=5.241E-04  HMET=2.545E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  482845.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.697E-03  TSS=3.482E+00  SFIDE=4.726E-05  FLIDE=1.328E-02
TFE =1.712E-01  DFE=6.960E-02  ZN =2.404E-05  PB   =3.836E-05  MN   =5.779E-02
COD =0.0        CU =0.0        TDS=5.671E-04  BOD  =1.467E-01  HMET =4.518E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.105E+02  NOX  =4.230E+00  SOX=4.257E+01  HC  =7.846E+01  CO =3.734E+02
GFL =1.310E+00  PFL  =1.088E+00  AMM=1.740E-01  HMET=8.054E-02  ALD=1.065E-08
ORG =5.687E+01  SFIDE=5.916E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    8364.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.205E-01  CYAN =2.782E-02  O&G =2.046E-01  PHEN=4.742E-03  TSS =8.778E-01
SFIDE=4.805E-03  FLIDE=3.303E-01  TI  =0.0        ZN  =2.120E-02  NITR=1.693E-01
PB   =1.183E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.031E+00  BOD  =4.420E-02  HMET=1.254E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.273 Large Bus, Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.089E+08  PET=5.592E+07  GAS=2.124E+08  ELEC=2.438E+08  HELEC=2.564E+07
OTH =9.045E+05  TOT=7.477E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.472E+01  NOX =6.843E+02  SOX =4.504E+00  HC=4.013E+00  CO=5.157E+01
ALD =3.283E-02  DACD=7.142E-04  HMET=2.546E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  490347.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.733E-02  TSS=4.423E+00  SFIDE=4.170E-05  FLIDE=1.859E-02
TFE =2.032E-01  DFE=1.175E-01  ZN =2.888E-05  PB   =4.523E-05  MN   =5.866E-02
COD =0.0        CU =0.0        TDS=2.710E+01  BOD  =1.676E-01  HMET =2.269E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.294E+02  NOX  =4.227E+00  SOX=4.304E+01  HC  =7.879E+01  CO =3.783E+02
GFL =2.106E+00  PFL  =1.793E+00  AMM=1.967E-01  HMET=8.514E-02  ALD=1.065E-08
ORG =5.687E+01  SFIDE=5.878E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    9116.2
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.827E+00  CYAN =3.204E-01  O&G =3.527E-01  PHEN=5.042E-02  TSS =5.240E+00
SFIDE=4.601E-03  FLIDE=1.505E+00  TI  =0.0        ZN  =2.099E-02  NITR=1.676E-01
PB   =1.172E-03  MN   =0.0        COD =4.176E-01  AL  =1.654E-01  CU  =4.725E-04
TDS  =3.795E+00  BOD  =1.643E-01  HMET=1.246E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.274 Large Bus, Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.685E+08  PET=4.489E+07  GAS=1.711E+08  ELEC=2.121E+08  HELEC=1.306E+07
OTH =1.032E+06  TOT=6.115E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.413E+01  NOX =6.768E+02  SOX =4.455E+00  HC=3.865E+00  CO=5.100E+01
ALD =3.247E-02  DACD=5.063E-04  HMET=2.553E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  484914.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.609E-03  TSS=3.498E+00  SFIDE=4.250E-05  FLIDE=1.340E-02
TFE =1.719E-01  DFE=7.003E-02  ZN =2.209E-05  PB   =3.525E-05  MN   =5.805E-02
COD =0.0        CU =0.0        TDS=5.100E-04  BOD  =1.485E-01  HMET =4.576E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.156E+02  NOX  =4.268E+00  SOX=4.279E+01  HC  =7.910E+01  CO =3.750E+02
GFL =1.519E+00  PFL  =1.272E+00  AMM=1.725E-01  HMET=7.393E-02  ALD=1.065E-08
ORG =5.737E+01  SFIDE=5.991E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    8577.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.210E-01  CYAN =2.799E-02  O&G =2.052E-01  PHEN=4.766E-03  TSS =8.860E-01
SFIDE=4.827E-03  FLIDE=3.375E-01  TI  =0.0        ZN  =2.123E-02  NITR=1.696E-01
PB   =1.185E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.032E+00  BOD  =4.467E-02  HMET=1.270E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.275 Large Bus, Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.631E+08  PET=4.897E+07  GAS=1.749E+08  ELEC=2.172E+08  HELEC=1.216E+07
OTH =1.128E+06  TOT=6.155E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.362E+01  NOX =6.703E+02  SOX =4.412E+00  HC=3.818E+00  CO=5.051E+01
ALD =3.215E-02  DACD=4.808E-04  HMET=2.568E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  480321.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.732E-03  TSS=3.464E+00  SFIDE=4.675E-05  FLIDE=1.328E-02
TFE =1.703E-01  DFE=6.949E-02  ZN =2.430E-05  PB   =3.877E-05  MN   =5.749E-02
COD =0.0        CU =0.0        TDS=5.610E-04  BOD  =1.480E-01  HMET =4.559E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.104E+02  NOX  =4.231E+00  SOX=4.242E+01  HC  =7.842E+01  CO =3.715E+02
GFL =1.320E+00  PFL  =1.096E+00  AMM=1.686E-01  HMET=8.132E-02  ALD=1.065E-08
ORG =5.686E+01  SFIDE=5.969E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     8345.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.199E-01  CYAN =2.777E-02  O&G =2.039E-01  PHEN=4.724E-03  TSS =8.776E-01
SFIDE=4.782E-03  FLIDE=3.292E-01  TI  =0.0        ZN  =2.114E-02  NITR=1.688E-01
PB   =1.180E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.035E+00  BOD  =4.430E-02  HMET=1.265E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.276 Large Bus, Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=2.061E+08  PET=5.482E+07  GAS=2.032E+08  ELEC=2.290E+08  HELEC=2.340E+07
OTH =8.960E+05  TOT=7.173E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=5.464E+01  NOX =6.834E+02  SOX =4.497E+00  HC=3.988E+00  CO=5.149E+01
ALD =3.278E-02  DACD=6.743E-04  HMET=2.539E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  489593.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=4.732E-02  TSS=4.417E+00  SFIDE=4.400E-05  FLIDE=1.859E-02
TFE =2.029E-01  DFE=1.173E-01  ZN =2.507E-05  PB   =3.926E-05  MN   =5.858E-02
COD =0.0        CU =0.0        TDS=2.721E+01  BOD  =1.695E-01  HMET =2.281E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.301E+02  NOX  =4.230E+00  SOX=4.299E+01  HC  =7.894E+01  CO =3.779E+02
GFL =2.138E+00  PFL  =1.822E+00  AMM=1.921E-01  HMET=7.450E-02  ALD=1.065E-08
DRG =5.686E+01  SFIDE=5.950E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    9145.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.824E+00  CYAN =3.200E-01  O&G =3.529E-01  PHEN=5.036E-02  TSS =5.291E+00
SFIDE=4.613E-03  FLIDE=1.525E+00  TI  =0.0        ZN  =2.102E-02  NITR=1.679E-01
PB   =1.173E-03  MN   =0.0        COD =4.207E-01  AL  =1.680E-01  CU  =4.801E-04
TDS  =3.795E+00  BOD  =1.649E-01  HMET=1.261E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.277 Trolley Bus, Diesel Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.337E+08  PET=3.724E+07  GAS=1.238E+08  ELEC=1.461E+08  HELEC=1.445E+07
OTH =7.073E+05  TOT=4.571E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.194E+01  NOX =3.911E+02  SOX =2.574E+00  HC=2.349E+00  CO=2.947E+01
ALD =1.877E-02  DACD=5.150E-04  HMET=3.757E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  279918.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.831E-02  TSS=2.535E+00  SFIDE=0.0        FLIDE=1.055E-02
TFE =1.161E-01  DFE=6.715E-02  ZN =0.0        PB   =0.0        MN   =3.351E-02
COD =0.0        CU =0.0        TDS=1.532E+01  BOD  =2.525E-01  HMET =1.769E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.023E+01  NOX  =2.396E+00  SOX=2.438E+01  HC  =4.472E+01  CO =2.159E+02
GFL =1.044E+00  PFL  =8.833E-01  AMM=1.241E-01  HMET=0.0        ALD=1.065E-08
ORG =3.222E+01  SFIDE=9.688E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5130.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.044E+00  CYAN =1.831E-01  O&G =2.002E-01  PHEN=2.878E-02  TSS =3.295E+00
SFIDE=2.580E-03  FLIDE=7.798E-01  TI  =0.0        ZN  =1.184E-02  NITR=9.475E-02
PB   =6.580E-04  MN   =0.0        COD =2.789E-01  AL  =1.288E-01  CU  =3.681E-04
TDS  =2.206E+00  BOD  =9.292E-02  HMET=2.051E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.278 Trolley Bus, Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.134E+08  PET=3.404E+07  GAS=1.190E+08  ELEC=1.396E+08  HELEC=1.186E+07
OTH =7.407E+05  TOT=4.194E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.465E+01  NOX =4.251E+02  SOX =2.798E+00  HC=2.490E+00  CO=3.203E+01
ALD =2.040E-02  DACD=4.375E-04  HMET=3.848E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  304271.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.304E-02  TSS=2.756E+00  SFIDE=0.0        FLIDE=1.170E-02
TFE =1.262E-01  DFE=7.299E-02  ZN =0.0        PB   =0.0        MN   =3.644E-02
COD =0.0        CU =0.0        TDS=1.821E+01  BOD  =2.607E-01  HMET =1.981E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.421E+01  NOX  =2.686E+00  SOX=2.687E+01  HC  =5.143E+01  CO =2.352E+02
GFL =1.026E+00  PFL  =8.621E-01  AMM=1.214E-01  HMET=0.0        ALD=1.065E-08
ORG =3.574E+01  SFIDE=9.923E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5511.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.135E+00  CYAN =1.990E-01  O&G =2.217E-01  PHEN=3.135E-02  TSS =3.792E+00
SFIDE=2.861E-03  FLIDE=8.042E-01  TI  =0.0        ZN  =1.314E-02  NITR=1.052E-01
PB   =7.302E-04  MN   =0.0        COD =3.544E-01  AL  =1.804E-01  CU  =5.155E-04
TDS  =2.590E+00  BOD  =1.097E-01  HMET=2.101E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.279 Trolley Bus, Diesel Engine Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.293E+08  PET=3.565E+07  GAS=1.267E+08  ELEC=1.545E+08  HELEC=1.027E+07
OTH =9.021E+05  TOT=4.580E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.695E+01  NOX =4.536E+02  SOX =2.985E+00  HC=2.639E+00  CO=3.418E+01
ALD =2.175E-02  DACD=4.334E-04  HMET=4.059E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  324662.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.997E-03  TSS=2.351E+00  SFIDE=0.0        FLIDE=8.760E-03
TFE =1.152E-01  DFE=4.635E-02  ZN =0.0        PB   =0.0        MN   =3.889E-02
COD =0.0        CU =0.0        TDS=0.0        BOD  =2.595E-01  HMET =7.995E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.445E+01  NOX  =2.789E+00  SOX=2.829E+01  HC  =5.194E+01  CO =2.511E+02
GFL =8.953E-01  PFL  =7.441E-01  AMM=1.260E-01  HMET=0.0        ALD=1.065E-08
ORG =3.745E+01  SFIDE=1.047E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5716.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.111E-02  CYAN =1.852E-02  O&G =1.372E-01  PHEN=3.177E-03  TSS =7.860E-01
SFIDE=3.231E-03  FLIDE=2.224E-01  TI  =0.0        ZN  =1.415E-02  NITR=1.132E-01
PB   =7.860E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.355E-01  BOD  =2.897E-02  HMET=2.216E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.280 Trolley Bus, Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.144E+08  PET=2.989E+07  GAS=1.109E+08  ELEC=1.412E+08  HELEC=8.834E+06
OTH =7.598E+05  TOT=4.072E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.466E+01  NOX =4.253E+02  SOX =2.800E+00  HC=2.478E+00  CO=3.205E+01
ALD =2.041E-02  DACD=4.126E-04  HMET=3.828E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  304449.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.770E-03  TSS=2.205E+00  SFIDE=0.0        FLIDE=8.400E-03
TFE =1.081E-01  DFE=4.343E-02  ZN =0.0        PB   =0.0        MN   =3.646E-02
COD =0.0        CU =0.0        TDS=0.0        BOD  =2.448E-01  HMET =7.540E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.424E+01  NOX  =2.698E+00  SOX=2.691E+01  HC  =5.160E+01  CO =2.354E+02
GFL =1.024E+00  PFL  =8.610E-01  AMM=1.187E-01  HMET=0.0        ALD=1.065E-08
ORG =3.591E+01  SFIDE=9.872E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5518.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.606E-02  CYAN =1.735E-02  O&G =1.282E-01  PHEN=2.978E-03  TSS =7.422E-01
SFIDE=3.030E-03  FLIDE=2.137E-01  TI  =0.0        ZN  =1.319E-02  NITR=1.055E-01
PB   =7.326E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.381E-01  BOD  =2.977E-02  HMET=2.090E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.281 Trolley Bus, Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.159E+08  PET=3.367E+07  GAS=1.167E+08  ELEC=1.497E+08  HELEC=8.263E+06
OTH =8.805E+05  TOT=4.245E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.676E+01  NOX =4.517E+02  SOX =2.973E+00  HC=2.615E+00  CO=3.404E+01
ALD =2.166E-02  DACD=4.053E-04  HMET=3.887E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  323337.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=3.828E-03  TSS=2.341E+00  SFIDE=0.0        FLIDE=8.760E-03
TFE =1.148E-01  DFE=4.632E-02  ZN =0.0        PB   =0.0        MN   =3.873E-02
COD =0.0        CU =0.0        TDS=0.0        BOD  =2.486E-01  HMET =7.657E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.429E+01  NOX  =2.789E+00  SOX=2.821E+01  HC  =5.186E+01  CO =2.502E+02
GFL =8.961E-01  PFL  =7.451E-01  AMM=1.226E-01  HMET=0.0        ALD=1.065E-08
ORG =3.745E+01  SFIDE=1.002E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5696.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =8.078E-02  CYAN =1.851E-02  O&G =1.368E-01  PHEN=3.169E-03  TSS =7.716E-01
SFIDE=3.219E-03  FLIDE=2.217E-01  TI  =0.0        ZN  =1.412E-02  NITR=1.130E-01
PB   =7.845E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =7.267E-01  BOD  =2.897E-02  HMET=2.122E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.282 School Bus, Otto Engine Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.276E+08  PET=3.542E+07  GAS=1.242E+08  ELEC=1.441E+08  HELEC=1.450E+07
OTH =6.305E+05  TOT=4.465E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.174E+01  NOX =3.954E+02  SOX =2.609E+00  HC=2.322E+00  CO=2.987E+01
ALD =1.902E-02  DACD=4.076E-04  HMET=1.601E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  284064.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.798E-02  TSS=2.563E+00  SFIDE=2.847E-05  FLIDE=1.082E-02
TFF =1.177E-01  DFE=6.807E-02  ZN =1.669E-05  PB   =2.614E-05  MN   =3.398E-02
COD =0.0        CU =0.0        TDS=1.598E+01  BOD  =1.034E-01  HMET =1.358E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.121E+01  NOX  =2.465E+00  SOX=2.549E+01  HC  =4.614E+01  CO =2.192E+02
GFL =1.049E+00  PFL  =8.865E-01  AMM=1.132E-01  HMET=4.953E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.643E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5137.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.058E+00  CYAN =1.856E-01  O&G =2.051E-01  PHEN=2.922E-02  TSS =3.149E+00
SFIDE=2.669E-03  FLIDE=7.875E-01  TI  =0.0        ZN  =1.221E-02  NITR=9.751E-02
PB   =6.819E-04  MN   =0.0        COD =2.828E-01  AL  =1.293E-01  CU  =3.695E-04
TDS  =2.241E+00  BOD  =9.676E-02  HMET=7.935E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.283 School Bus, Diesel Engine Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.703E+07  PET=3.005E+07  GAS=1.077E+08  ELEC=1.232E+08  HELEC=1.049E+07
OTH =6.147E+05  TOT=3.692E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.157E+01  NOX =3.947E+02  SOX =2.598E+00  HC=2.279E+00  CO=2.974E+01
ALD =1.893E-02  DACD=3.429E-04  HMET=1.496E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  282842.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.942E-02  TSS=2.552E+00  SFIDE=2.975E-05  FLIDE=1.081E-02
TFE =1.172E-01  DFE=6.778E-02  ZN =1.707E-05  PB   =2.673E-05  MN   =3.385E-02
COD =0.0        CU =0.0        TDS=1.692E+01  BOD  =9.922E-02  HMET =1.400E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.798E+01  NOX  =2.485E+00  SOX=2.510E+01  HC  =4.779E+01  CO =2.186E+02
GFL =9.088E-01  PFL  =7.626E-01  AMM=1.059E-01  HMET=5.070E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.452E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     5013.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.054E+00  CYAN =1.848E-01  O&G =2.067E-01  PHEN=2.911E-02  TSS =3.254E+00
SFIDE=2.686E-03  FLIDE=7.209E-01  TI  =0.0        ZN  =1.232E-02  NITR=9.835E-02
PB   =6.878E-04  MN   =0.0        COD =3.189E-01  AL  =1.596E-01  CU  =4.560E-04
TDS  =2.361E+00  BOD  =1.019E-01  HMET=7.318E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.284 School Bus, Diesel Engine, Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.075E+08  PET=2.985E+07  GAS=1.095E+08  ELEC=1.311E+09  HELEC=8.742E+06
OTH =7.006E+05  TOT=3.875E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.219E+01  NOX =4.026E+02  SOX =2.649E+00  HC=2.316E+00  CO=3.034E+01
ALD =1.930E-02  DACD=3.315E-04  HMET=1.496E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  288485.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.223E-03  TSS=2.079E+00  SFIDE=2.975E-05  FLIDE=7.720E-03
TFE =1.023E-01  DFE=4.147E-02  ZN =1.513E-05  PB   =2.415E-05  MN   =3.452E-02
COD =0.0        CU =0.0        TDS=3.570E-04  BOD  =8.558E-02  HMET =2.636E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.543E+01  NOX  =2.463E+00  SOX=2.525E+01  HC  =4.609E+01  CO =2.230E+02
GFL =7.633E-01  PFL  =6.334E-01  AMM=1.061E-01  HMET=5.070E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.452E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    4975.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.200E-02  CYAN =1.657E-02  O&G =1.221E-01  PHEN=2.830E-03  TSS =5.205E-01
SFIDE=2.870E-03  FLIDE=1.967E-01  TI  =0.0        ZN  =1.264E-02  NITR=1.010E-01
PB   =7.060E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =6.052E-01  BOD  =2.571E-02  HMET=7.317E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.285 School Bus, Diesel Engine Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.218E+08  PET=3.254E+07  GAS=1.237E+08  ELEC=1.419E+08  HELEC=1.492E+07
OTH =5.351E+05  TOT=4.354E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.193E+01  NOX =3.993E+02  SOX =2.628E+00  HC=2.350E+00  CO=3.009E+01
ALD =1.916E-02  DACD=4.320E-04  HMET=1.497E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  286142.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.760E-02  TSS=2.581E+00  SFIDE=2.625E-05  FLIDE=1.081E-02
TFF =1.186E-01  DFE=6.856E-02  ZN =1.818E-05  PB   =2.847E-05  MN   =3.423E-02
COD =0.0        CU =0.0        TDS=1.576E+01  BOD  =9.769E-02  HMET =1.320E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.541E+01  NOX  =2.458E+00  SOX=2.510E+01  HC  =4.588E+01  CO =2.207E+02
GFL =1.225E+00  PFL  =1.044E+00  AMM=1.165E-01  HMET=5.360E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.428E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     5312.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.066E+00  CYAN =1.870E-01  O&G =2.055E-01  PHEN=2.941E-02  TSS =3.051E+00
SFIDE=2.678E-03  FLIDE=8.759E-01  TI  =0.0        ZN  =1.222E-02  NITR=9.758E-02
PB   =6.828E-04  MN   =0.0        COD =2.429E-01  AL  =9.623E-02  CU  =2.749E-04
TDS  =2.213E+00  BOD  =9.556E-02  HMET=7.267E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.286 School Bus, Diesel Engine Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=9.811E+07  PET=2.670E+07  GAS=1.020E+08  ELEC=1.247E+08  HELEC=7.893E+06
OTH =6.250E+05  TOT=3.607E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.140E+01  NOX =3.925E+02  SOX =2.583E+00  HC=2.252E+00  CO=2.957E+01
ALD =1.883E-02  OACD=3.142E-04  HMET=1.514E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  281238.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.256E-03  TSS=2.028E+00  SFIDE=2.975E-05  FLIDE=7.720E-03
TFE =9.970E-02  DFE=4.048E-02  ZN =1.546E-05  PB   =2.467E-05  MN   =3.366E-02
COD =0.0        CU =0.0        TDS=3.570E-04  BOD  =8.647E-02  HMET =2.664E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.794E+01  NOX  =2.486E+00  SOX=2.501E+01  HC  =4.776E+01  CO =2.174E+02
GFL =9.161E-01  PFL  =7.692E-01  AMM=1.023E-01  HMET=5.175E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.487E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=     5003.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.019E-02  CYAN =1.618E-02  O&G =1.188E-01  PHEN=2.760E-03  TSS =5.151E-01
SFIDE=2.798E-03  FLIDE=1.966E-01  TI  =0.0        ZN  =1.229E-02  NITR=9.809E-02
PB   =6.861E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =6.418E-01  BOD  =2.760E-02  HMET=7.394E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.287 School Bus, Diesel Engine Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.716E+07  PET=2.870E+07  GAS=1.029E+08  ELEC=1.283E+08  HELEC=7.088E+06
OTH =6.763E+05  TOT=3.638E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.203E+01  NOX =4.005E+02  SOX =2.636E+00  HC=2.291E+00  CO=3.018E+01
ALD =1.920E-02  DACD=3.054E-04  HMET=1.514E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  287004.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.256E-03  TSS=2.069E+00  SFIDE=2.975E-05  FLIDE=7.720E-03
TFE =1.018E-01  DFE=4.140E-02  ZN =1.546E-05  PB   =2.467E-05  MN   =3.435E-02
COD =0.0        CU =0.0        TDS=3.570E-04  BOD  =8.647E-02  HMET =2.664E-04
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.538E+01  NOX  =2.464E+00  SOX=2.517E+01  HC  =4.608E+01  CO =2.219E+02
GFL =7.695E-01  PFL  =6.390E-01  AMM=1.028E-01  HMET=5.175E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.487E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    4965.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =7.163E-02  CYAN =1.655E-02  O&G =1.217E-01  PHEN=2.819E-03  TSS =5.206E-01
SFIDE=2.856E-03  FLIDE=1.961E-01  TI  =0.0        ZN  =1.261E-02  NITR=1.007E-01
PB   =7.041E-04  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =6.086E-01  BOD  =2.578E-02  HMET=7.393E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.288 School Bus, Diesel Engine Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.202E+08  PET=3.192E+07  GAS=1.184E+08  ELEC=1.334E+08  HELEC=1.364E+07
OTH =5.316E+05  TOT=4.180E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=3.190E+01  NOX =3.989E+02  SOX =2.625E+00  HC=2.336E+00  CO=3.006E+01
ALD =1.914E-02  DACD=4.090E-04  HMET=1.495E-02
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  285818.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.761E-02  TSS=2.578E+00  SFIDE=2.800E-05  FLIDE=1.081E-02
TFE =1.184E-01  DFE=6.850E-02  ZN =1.595E-05  PB   =2.498E-05  MN   =3.420E-02
COD =0.0        CU =0.0        TDS=1.583E+01  BOD  =9.893E-02  HMET =1.328E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=7.586E+01  NOX  =2.460E+00  SOX=2.508E+01  HC  =4.598E+01  CO =2.205E+02
GFL =1.246E+00  PFL  =1.062E+00  AMM=1.139E-01  HMET=4.741E-02  ALD=1.065E-08
ORG =3.306E+01  SFIDE=3.475E+00
TOTAL SOLIDS - MFG(LBS)
SOLIDS=    5333.5
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.065E+00  CYAN =1.868E-01  O&G =2.057E-01  PHEN=2.938E-02  TSS =3.084E+00
SFIDE=2.686E-03  FLIDE=8.889E-01  TI  =0.0        ZN  =1.225E-02  NITR=9.780E-02
PB   =6.837E-04  MN   =0.0        COD =2.449E-01  AL  =9.792E-02  CU  =2.798E-04
TDS  =2.213E+00  BOD  =9.593E-02  HMET=7.368E-02  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.289 Light Rail Vehicle Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=4.858E+08  PET=8.227E+07  GAS=2.701E+08  ELEC=3.643E+08  HELEC=9.311E+06
OTH =2.308E+06  TOT=1.218E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.299E+02  NOX =1.603E+03  SOX =1.051E+01  HC=1.080E+01  CO=1.208E+02
ALD =7.558E-02  DACD=4.240E-03  HMET=1.211E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1147314.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.110E-02  TSS=1.025E+01  SFIDE=0.0        FLIDE=9.768E-03
TFE =4.761E-01  DFE=2.753E-01  ZN =0.0        PB   =0.0        MN   =1.371E-01
COD =0.0        CU =0.0        TDS=3.684E+01  BOD  =8.038E-01  HMET =4.858E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.909E+02  NOX  =3.170E+00  SOX=8.317E+01  HC  =1.362E+02  CO =8.770E+02
GFL =7.039E-01  PFL  =5.719E-01  AMM=7.574E-01  HMET=0.0        ALD=1.065E-08
ORG =5.785E-01  SFIDE=3.122E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   17120.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.283E+00  CYAN =7.496E-01  O&G =7.612E-01  PHEN=1.105E-01  TSS =6.567E+00
SFIDE=9.522E-03  FLIDE=9.917E-01  TI  =0.0        ZN  =4.495E-02  NITR=3.596E-01
PB   =2.497E-03  MN   =0.0        COD =2.147E-01  AL  =8.301E-02  CU  =2.372E-04
TDS  =5.463E+00  BOD  =2.101E-01  HMET=6.607E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.290 Light Rail Vehicle Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=3.668E+08  PET=6.350E+07  GAS=2.304E+08  ELEC=3.003E+08  HELEC=7.253E+06
OTH =2.245E+06  TOT=9.731E+08
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.271E+02  NOX =1.568E+03  SOX =1.028E+01  HC=1.032E+01  CO=1.181E+02
ALD =7.385E-02  DACD=3.691E-03  HMET=1.220E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1121787.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.119E-02  TSS=1.002E+01  SFIDE=0.0        FLIDE=9.768E-03
TFE =4.655E-01  DFE=2.692E-01  ZN =0.0        PB   =0.0        MN   =1.341E-01
COD =0.0        CU =0.0        TDS=3.684E+01  BOD  =8.096E-01  HMET =4.876E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.865E+02  NOX  =3.170E+00  SOX=8.155E+01  HC  =1.346E+02  CO =8.596E+02
GFL =6.609E-01  PFL  =5.309E-01  AMM=6.907E-01  HMET=0.0        ALD=1.065E-08
ORG =5.785E-01  SFIDE=3.145E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   16963.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.188E+00  CYAN =7.332E-01  O&G =7.576E-01  PHEN=1.082E-01  TSS =6.704E+00
SFIDE=9.522E-03  FLIDE=9.770E-01  TI  =0.0        ZN  =4.537E-02  NITR=3.630E-01
PB   =2.521E-03  MN   =0.0        COD =2.476E-01  AL  =1.104E-01  CU  =3.153E-04
TDS  =5.467E+00  BOD  =2.101E-01  HMET=6.657E-01  MO  =0.0        ARS =0.0 .
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.291 Light Rail Vehicle Energy and Residuals, 1990, Technology Set B

```
#OTBTU BY FUEL TYPE
COAL=4.044E+08  PET=7.076E+07  GAS=2.554E+08  ELEC=3.341E+08  HELEC=6.074E+06
OTH =2.852E+06  TOT=1.076E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.256E+02  NOX =1.547E+03  SOX =1.014E+01  HC=1.004E+01  CO=1.165E+02
ALD =7.284E-02  DACD=3.369E-03  HMET=1.267E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1106831.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.248E-02  TSS=7.906E+00  SFIDE=0.0        FLIDE=6.977E-03
TFE =3.932E-01  DFE=1.457E-01  ZN =0.0        PB   =0.0        MN   =1.323E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =8.100E-01  HMET =2.495E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.822E+02  NOX  =3.170E+00  SOX=8.060E+01  HC  =1.337E+02  CO =8.496E+02
GFL =5.665E-01  PFL  =4.441E-01  AMM=6.516E-01  HMET=0.0        ALD=1.065E-08
ORG =5.785E-01  SFIDE=3.267E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   16855.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.765E-01  CYAN =5.808E-02  O&G =4.533E-01  PHEN=1.047E-02  TSS =2.456E+00
SFIDE=1.095E-02  FLIDE=6.825E-01  TI  =0.0        ZN  =4.582E-02  NITR=3.666E-01
PB   =2.546E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.741E+00  BOD  =5.994E-02  HMET=6.914E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.292 Light Rail Vehicle Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=4.588E+08  PET=7.704E+07  GAS=2.617E+08  ELEC=3.479E+08  HELEC=1.048E+07
OTH =1.856E+06  TOT=1.161E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.307E+02  NOX =1.614E+03  SOX =1.058E+01  HC=1.094E+01  CO=1.216E+02
ALD =7.609E-02  DACD=4.404E-03  HMET=1.196E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1154855.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.096E-02  TSS=1.031E+01  SFIDE=0.0        FLIDE=9.768E-03
TFE =4.793E-01  DFE=2.771E-01  ZN =0.0        PB   =0.0        MN   =1.379E-01
COD =0.0        CU =0.0        TDS=3.684E+01  BOD  =7.945E-01  HMET =4.830E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.960E+02  NOX  =3.170E+00  SOX=8.364E+01  HC  =1.366E+02  CO =8.818E+02
GFL =8.852E-01  PFL  =7.355E-01  AMM=7.772E-01  HMET=0.0        ALD=1.065E-08
ORG =5.785E-01  SFIDE=3.085E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   17270.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.312E+00  CYAN =7.545E-01  O&G =7.597E-01  PHEN=1.112E-01  TSS =6.599E+00
SFIDE=9.522E-03  FLIDE=1.090E+00  TI  =0.0        ZN  =4.452E-02  NITR=3.562E-01
PB   =2.473E-03  MN   =0.0        COD =1.963E-01  AL  =6.761E-02  CU  =1.932E-04
TDS  =5.455E+00  BOD  =2.101E-01  HMET=6.529E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.293 Light Rail Vehicle Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL =3.566E+08  PET=6.160E+07  GAS=3.143E+08  ELEC=4.676E+08  HELEC=4.011E+07
OTH =3.450E+06  TOT=1.247E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.167E+02  NOX =1.434E+03  SOX =9.406E+00  HC=9.536E+00  CO=1.081E+02
ALD =6.762E-02  DACD=3.555E-03  HMET=1.237E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1026429.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.218E-02  TSS=7.336E+00  SFIDE=0.0        FLIDE=6.776E-03
TFF =3.646E-01  DFE=1.325E-01  ZN =0.0        PB   =0.0        MN   =1.226E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =7.908E-01  HMET =2.436E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.650E+02  NOX  =3.042E+00  SOX=7.519E+01  HC  =1.270E+02  CO =7.859E+02
GFL =4.474E+00  PFL  =3.911E+00  AMM=6.512E-01  HMET=0.0        ALD=1.065E-08
ORG =5.618E-01  SFIDE=3.190E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19077.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.564E-01  CYAN =5.279E-02  O&G =4.133E-01  PHEN=9.635E-03  TSS =2.365E+00
SFIDE=1.014E-02  FLIDE=7.434E-01  TI  =0.0        ZN  =4.127E-02  NITR=3.302E-01
PB   =2.293E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.694E+00  BOD  =5.821E-02  HMET=6.750E-01  MO  =0.0        ARS =0.0
NT   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.294 Light Rail Vehicle Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=3.502E+08  PET=7.318E+07  GAS=3.217E+08  ELEC=4.684E+08  HELEC=3.758E+07
OTH =4.017E+06  TOT=1.250E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.150E+02  NOX =1.413E+03  SOX =9.268E+00  HC=9.255E+00  CO=1.065E+02
ALD =6.660E-02  DACD=3.231E-03  HMET=1.237E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1011368.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.218E-02  TSS=7.229E+00  SFIDE=0.0        FLIDE=6.776E-03
TFF =3.593E-01  DFE=1.322E-01  ZN =0.0        PB   =0.0        MN   =1.209E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =7.908E-01  HMET =2.436E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.498E+02  NOX  =3.042E+00  SOX=7.423E+01  HC  =1.260E+02  CO =7.759E+02
GFL =3.890E+00  PFL  =3.390E+00  AMM=6.118E-01  HMET=0.0        ALD=1.065E-08
ORG =5.618E-01  SFIDE=3.190E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   18496.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.527E-01  CYAN =5.270E-02  O&G =4.132E-01  PHEN=9.542E-03  TSS =2.355E+00
SFIDE=9.998E-03  FLIDE=7.205E-01  TI  =0.0        ZN  =4.169E-02  NITR=3.335E-01
PB   =2.316E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =1.694E+00  BOD  =5.821E-02  HMET=6.750E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.295 Light Rail Vehicle Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=4.382E+08  PET=7.461E+07  GAS=2.737E+08  ELEC=3.541E+08  HELEC=2.241E+07
OTH =1.619E+06  TOT=1.167E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.259E+02  NOX =1.553E+03  SOX =1.018E+01  HC=1.055E+01  CO=1.170E+02
ALD =7.321E-02  DACD=4.297E-03  HMET=1.198E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1110951.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.011E-02  TSS=9.925E+00  SFIDE=0.0        FLIDE=9.625E-03
TFE =4.610E-01  DFE=2.666E-01  ZN =0.0        PB   =0.0        MN   =1.327E-01
COD =0.0        CU =0.0        TDS=3.630E+01  BOD  =7.952E-01  HMET =4.797E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.166E+02  NOX  =3.109E+00  SOX=8.070E+01  HC  =1.330E+02  CO =8.480E+02
GFL =2.027E+00  PFL  =1.748E+00  AMM=7.542E-01  HMET=0.0        ALD=1.065E-08
ORG =5.700E-01  SFIDE=3.089E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   17693.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =4.148E+00  CYAN =7.258E-01  O&G =7.309E-01  PHEN=1.071E-01  TSS =8.102E+00
SFIDE=9.132E-03  FLIDE=1.755E+00  TI  =0.0        ZN  =4.273E-02  NITR=3.418E-01
PB   =2.374E-03  MN   =0.0        COD =3.066E-01  AL  =1.610E-01  CU  =4.599E-04
TDS  =5.385E+00  BOD  =2.070E-01  HMET=6.538E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.296 Heavy Rail Vehicle Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=6.011E+08  PET=1.474E+08  GAS=9.141E+08  ELEC=1.180E+09  HELEC=2.671E+08
OTH =5.575E+06  TOT=3.120E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.956E+01  NOX =1.202E+03  SOX =7.885E+00  HC=7.229E+00  CO=9.054E+01
ALD =5.665E-02  DACD=1.519E-03  HMET=1.663E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  859936.4
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.729E-02  TSS=7.728E+00  SFIDE=0.0        FLIDE=1.170E-02
TFE =3.568E-01  DFE=2.063E-01  ZN =0.0        PB   =0.0        MN   =1.030E-01
COD =0.0        CU =0.0        TDS=4.414E+01  BOD  =1.099E+00  HMET =6.240E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.776E+02  NOX  =3.589E+00  SOX=6.695E+01  HC  =1.321E+02  CO =6.634E+02
GFL =1.848E+01  PFL  =1.632E+01  AMM=3.842E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.289E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   30060.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.208E+00  CYAN =5.625E-01  O&G =6.118E-01  PHEN=8.400E-02  TSS =3.822E+01
SFIDE=7.915E-03  FLIDE=1.196E+01  TI  =0.0        ZN  =3.635E-02  NITR=2.908E-01
PB   =2.020E-03  MN   =0.0        COD =2.995E+00  AL  =2.381E+00  CU  =6.803E-03
TDS  =6.655E+00  BOD  =2.517E-01  HMET=9.077E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.297 Heavy Rail Vehicle Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.129E+08  PET=1.120E+08  GAS=7.299E+08  ELEC=1.051E+09  HELEC=1.883E+08
OTH =5.587E+06  TOT=2.604E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.827E+01  NOX =1.183E+03  SOX =7.761E+00  HC=6.975E+00  CO=8.910E+01
ALD =5.573E-02  DACD=1.226E-03  HMET=1.736E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  846335.1
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.800E-02  TSS=7.610E+00  SFIDE=0.0        FLIDE=1.170E-02
TFE =3.512E-01  DFE=2.031E-01  ZN =0.0        PB   =0.0        MN   =1.014E-01
COD =0.0        CU =0.0        TDS=4.414E+01  BOD  =1.145E+00  HMET =6.383E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.091E+02  NOX  =3.589E+00  SOX=6.609E+01  HC  =1.313E+02  CO =6.541E+02
GFL =1.551E+01  PFL  =1.369E+01  AMM=3.486E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.476E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   27279.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.157E+00  CYAN =5.537E-01  O&G =6.086E-01  PHEN=8.274E-02  TSS =3.926E+01
SFIDE=7.915E-03  FLIDE=1.046E+01  TI  =0.0        ZN  =3.643E-02  NITR=2.915E-01
PB   =2.024E-03  MN   =0.0        COD =3.577E+00  AL  =2.866E+00  CU  =8.189E-03
TDS  =6.692E+00  BOD  =2.517E-01  HMET=9.473E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.298 Heavy Rail Vehicle Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.063E+08  PET=1.111E+08  GAS=7.239E+08  ELEC=1.054E+09  HELEC=1.635E+08
OTH =6.630E+06  TOT=2.569E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.805E+01  NOX =1.177E+03  SOX =7.724E+00  HC=6.901E+00  CO=8.868E+01
ALD =5.546E-02  DACD=1.140E-03  HMET=1.808E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  842350.5
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.781E-02  TSS=6.061E+00  SFIDE=0.0        FLIDE=8.360E-03
TFE =2.991E-01  DFE=1.197E-01  ZN =0.0        PB   =0.0        MN   =1.009E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =1.156E+00  HMET =3.562E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.615E+02  NOX  =3.589E+00  SOX=6.584E+01  HC  =1.310E+02  CO =6.516E+02
GFL =1.342E+01  PFL  =1.184E+01  AMM=3.382E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.663E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   25387.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.105E-01  CYAN =4.780E-02  O&G =3.552E-01  PHEN=8.227E-03  TSS =2.800E+00
SFIDE=8.382E-03  FLIDE=9.001E-01  TI  =0.0        ZN  =3.659E-02  NITR=2.927E-01
PB   =2.033E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.235E+00  BOD  =7.182E-02  HMET=9.869E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.299 Heavy Rail Vehicle Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=5.827E+08  PET=1.359E+08  GAS=1.006E+09  ELEC=1.252E+09  HELEC=2.822E+08
OTH =4.307E+06  TOT=3.267E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.958E+01  NOX =1.201E+03  SOX =7.878E+00  HC=7.214E+00  CO=9.046E+01
ALD =5.660E-02  DACD=1.503E-03  HMET=1.699E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  859168.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.765E-02  TSS=7.723E+00  SFIDE=0.0        FLIDE=1.170E-02
TFE =3.565E-01  DFE=2.061E-01  ZN =0.0        PB   =0.0        MN   =1.029E-01
COD =0.0        CU =0.0        TDS=4.414E+01  BOD  =1.122E+00  HMET =6.311E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.643E+02  NOX  =3.589E+00  SOX=6.690E+01  HC  =1.320E+02  CO =6.626E+02
GFL =2.233E+01  PFL  =1.973E+01  AMM=3.822E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.383E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   33574.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.205E+00  CYAN =5.620E-01  O&G =6.100E-01  PHEN=8.393E-02  TSS =3.743E+01
SFIDE=7.915E-03  FLIDE=1.393E+01  TI  =0.0        ZN  =3.618E-02  NITR=2.894E-01
PB   =2.010E-03  MN   =0.0        COD =2.322E+00  AL  =1.820E+00  CU  =5.200E-03
TDS  =6.673E+00  BOD  =2.517E-01  HMET=9.275E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.300 Heavy Rail Vehicle Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=5.263E+08  PET=9.706E+07  GAS=6.524E+08  ELEC=1.058E+09  HELEC=1.404E+08
OTH =6.085E+06  TOT=2.485E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.810E+01  NOX =1.178E+03  SOX =7.732E+00  HC=6.917E+00  CO=8.877E+01
ALD =5.552E-02  DACD=1.159E-03  HMET=1.796E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  843191.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.769E-02  TSS=6.066E+00  SFIDE=0.0        FLIDE=8.360E-03
TFE =2.994E-01  DFE=1.197E-01  ZN =0.0        PB   =0.0        MN   =1.010E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =1.148E+00  HMET =3.537E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=5.084E+02  NOX  =3.589E+00  SOX=6.589E+01  HC  =1.311E+02  CO =6.518E+02
GFL =1.550E+01  PFL  =1.368E+01  AMM=3.405E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.631E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   27262.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.107E-01  CYAN =4.780E-02  O&G =3.542E-01  PHEN=8.232E-03  TSS =2.819E+00
SFIDE=8.390E-03  FLIDE=9.600E-01  TI  =0.0        ZN  =3.638E-02  NITR=2.911E-01
PB   =2.021E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.229E+00  BOD  =7.182E-02  HMET=9.800E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.301 Heavy Rail Vehicle Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=4.877E+08  PET=1.225E+08  GAS=6.381E+08  ELEC=9.875E+08  HELEC=1.316E+08
OTH =6.541E+06  TOT=2.353E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.758E+01  NOX =1.172E+03  SOX =7.688E+00  HC=6.828E+00  CO=8.827E+01
ALD =5.519E-02  DACD=1.057E-03  HMET=1.796E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  838436.9
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0          O&G=1.769E-02  TSS=6.032E+00  SFIDE=0.0          FLIDE=8.360E-03
TFE =2.977E-01    DFE=1.196E-01  ZN =0.0        PB   =0.0          MN   =1.004E-01
COD =0.0          CU =0.0        TDS=0.0        BOD  =1.148E+00    HMET =3.537E-03
ARS =0.0          CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=4.614E+02  NOX  =3.589E+00  SOX=6.559E+01  HC  =1.308E+02  CO =6.488E+02
GFL =1.344E+01  PFL  =1.186E+01  AMM=3.280E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.631E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   25359.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.095E-01  CYAN =4.778E-02  O&G =3.541E-01  PHEN=8.202E-03  TSS =2.788E+00
SFIDE=8.346E-03  FLIDE=8.986E-01  TI  =0.0        ZN  =3.652E-02  NITR=2.921E-01
PB   =2.029E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =2.229E+00  BOD  =7.182E-02  HMET=9.800E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0         PET=0.0         GAS=0.0         ELEC=0.0         HELEC=0.0
OTH =0.0         TOT=0.0
```

Table B.302 Heavy Rail Vehicle Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=5.559E+08  PET=1.257E+08  GAS=9.434E+08  ELEC=1.194E+09  HELEC=2.540E+08
OTH =4.164E+06  TOT=3.080E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=9.939E+01  NOX =1.197E+03  SOX =7.853E+00  HC=7.163E+00  CO=9.017E+01
ALD =5.641E-02  DACD=1.443E-03  HMET=1.736E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  856416.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=8.800E-02  TSS=7.700E+00  SFIDE=0.0        FLIDE=1.170E-02
TFE =3.553E-01  DFE=2.055E-01  ZN =0.0        PB   =0.0        MN   =1.025E-01
COD =0.0        CU =0.0        TDS=4.414E+01  BOD  =1.145E+00  HMET =6.383E-03
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=6.651E+02  NOX  =3.589E+00  SOX=6.673E+01  HC  =1.319E+02  CO =6.606E+02
GFL =2.238E+01  PFL  =1.978E+01  AMM=3.750E-01  HMET=0.0        ALD=1.065E-08
ORG =4.765E-01  SFIDE=4.476E+01
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   33610.4
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.195E+00  CYAN =5.602E-01  O&G =6.090E-01  PHEN=8.367E-02  TSS =3.753E+01
SFIDE=7.915E-03  FLIDE=1.396E+01  TI  =0.0        ZN  =3.615E-02  NITR=2.892E-01
PB   =2.008E-03  MN   =0.0        COD =2.327E+00  AL  =1.824E+00  CU  =5.211E-03
TDS  =6.692E+00  BOD  =2.517E-01  HMET=9.473E-01  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.303 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=1.223E+09  PET=2.718E+08  GAS=6.222E+08  ELEC=9.814E+08  HELEC=5.374E+07
OTH =3.501E+06  TOT=3.163E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.099E+02  NOX =2.198E+03  SOX =1.441E+01  HC=1.286E+01  CO=1.656E+02
ALD =1.033E-01  DACD=2.077E-03  HMET=1.261E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1585943.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.145E-01  TSS=1.449E+01  SFIDE=0.0        FLIDE=1.722E-02
TFE =6.527E-01  DFE=3.774E-01  ZN =1.556E-04  PB   =1.204E-04  MN   =1.884E-01
COD =0.0        CU =0.0        TDS=5.159E+01  BOD  =8.018E+00  HMET =2.804E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.338E+02  NOX  =5.160E+00  SOX=1.168E+02  HC  =1.933E+02  CO =1.215E+03
GFL =3.790E+00  PFL  =3.285E+00  AMM=6.280E-01  HMET=3.991E-01  ALD=1.065E-08
ORG =5.210E+01  SFIDE=3.217E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   31581.7
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.868E+00  CYAN =1.029E+00  O&G =1.097E+00  PHEN=1.528E-01  TSS =2.291E+01
SFIDE=1.480E-02  FLIDE=3.221E+00  TI  =0.0        ZN  =6.780E-02  NITR=5.407E-01
PB   =3.904E-03  MN   =0.0        COD =7.779E-01  AL  =4.791E-01  CU  =1.369E-03
TDS  =1.384E+01  BOD  =2.972E-01  HMET=6.805E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.304 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.033E+09  PET=1.905E+08  GAS=5.160E+08  ELEC=8.814E+08  HELEC=3.935E+07
OTH =3.748E+06  TOT=2.672E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.081E+02  NOX =2.172E+03  SOX =1.425E+01  HC=1.252E+01  CO=1.636E+02
ALD =1.021E-01  DACD=1.678E-03  HMET=1.270E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1566228.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.147E-01  TSS=1.433E+01  SFIDE=0.0        FLIDE=1.722E-02
TFE =6.449E-01  DFE=3.730E-01  ZN =1.414E-04  PB   =1.095E-04  MN   =1.863E-01
COD =0.0        CU =0.0        TDS=5.159E+01  BOD  =8.082E+00  HMET =2.823E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.207E+02  NOX  =5.160E+00  SOX=1.155E+02  HC  =1.922E+02  CO =1.203E+03
AFL =3.313E+00  PFL  =2.862E+00  AMM=5.794E-01  HMET=3.726E-01  ALD=1.065E-08
ORG =5.210E+01  SFIDE=3.243E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   31065.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.798E+00  CYAN =1.017E+00  O&G =1.093E+00  PHEN=1.511E-01  TSS =2.343E+01
SFIDE=1.480E-02  FLIDE=2.996E+00  TI  =0.0        ZN  =6.789E-02  NITR=5.415E-01
PB   =3.901E-03  MN   =0.0        COD =9.216E-01  AL  =5.989E-01  CU  =1.711E-03
TDS  =1.392E+01  BOD  =2.972E-01  HMET=6.859E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.305 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=1.026E+09  PET=2.080E+08  GAS=5.635E+08  ELEC=9.280E+08  HELEC=3.374E+07
OTH =4.899E+06  TOT=2.769E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.077E+02  NOX =2.164E+03  SOX =1.420E+01  HC=1.242E+01  CO=1.631E+02
ALD =1.017E-01  DACD=1.561E-03  HMET=1.279E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1559918.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.321E-01  TSS=1.150E+01  SFIDE=0.0        FLIDE=1.230E-02
TFE =5.499E-01  DFE=2.232E-01  ZN =1.161E-04  PB   =9.330E-05  MN   =1.856E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =8.103E+00  HMET =2.496E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.092E+02  NOX  =5.160E+00  SOX=1.151E+02  HC  =1.919E+02  CO =1.199E+03
GFL =2.845E+00  PFL  =2.445E+00  AMM=5.652E-01  HMET=3.527E-01  ALD=1.065E-08
ORG =5.210E+01  SFIDE=3.268E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   30669.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.871E-01  CYAN =8.920E-02  O&G =6.564E-01  PHEN=1.522E-02  TSS =1.218E+01
SFIDE=1.543E-02  FLIDE=1.027E+00  TI  =0.0        ZN  =6.810E-02  NITR=5.433E-01
PB   =3.906E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.742E+00  BOD  =8.395E-02  HMET=6.913E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.306 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.115E+09  PET=2.398E+08  GAS=6.057E+08  ELEC=9.157E+08  HELEC=5.823E+07
OTH =2.903E+06  TOT=2.944E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.099E+02  NOX =2.196E+03  SOX =1.441E+01  HC=1.284E+01  CO=1.655E+02
ALD =1.033E-01  OACD=2.055E-03  HMET=1.266E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1584896.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.150E-01  TSS=1.448E+01  SFIDE=0.0        FLIDE=1.722E-02
TFE =6.522E-01  DFE=3.772E-01  ZN =1.556E-04  PB   =1.204E-04  MN   =1.883E-01
COD =0.0        CU =0.0        TDS=5.159E+01  BOD  =8.050E+00  HMET =2.814E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.538E+02  NOX  =5.160E+00  SOX=1.167E+02  HC  =1.933E+02  CO =1.214E+03
GFL =4.678E+00  PFL  =4.073E+00  AMM=6.252E-01  HMET=3.991E-01  ALD=1.065E-08
ORG =5.210E+01  SFIDE=3.230E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   32371.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.864E+00  CYAN =1.029E+00  O&G =1.095E+00  PHEN=1.527E-01  TSS =2.295E+01
SFIDE=1.480E-02  FLIDE=3.686E+00  TI  =0.0        ZN  =6.756E-02  NITR=5.387E-01
PB   =3.890E-03  MN   =0.0        COD =6.537E-01  AL  =3.756E-01  CU  =1.073E-03
TDS  =1.387E+01  BOD  =2.972E-01  HMET=6.832E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.307 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=1.055E+09  PET=1.574E+08  GAS=4.790E+08  ELEC=8.973E+08  HELEC=2.924E+07
OTH =4.110E+06  TOT=2.628E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.074E+02  NOX =2.160E+03  SOX =1.416E+01  HC=1.243E+01  CO=1.627E+02
ALD =1.015E-01  DACD=1.643E-03  HMET=1.279E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1557377.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.326E-01  TSS=1.148E+01  SFIDE=0.0        FLIDE=1.224E-02
TFE =5.487E-01  DFE=2.222E-01  ZN =1.248E-04  PB   =1.004E-04  MN   =1.852E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =8.101E+00  HMET =2.496E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.190E+02  NOX  =5.135E+00  SOX=1.149E+02  HC  =1.912E+02  CO =1.196E+03
GFL =3.299E+00  PFL  =2.850E+00  AMM=5.734E-01  HMET=3.707E-01  ALD=1.065E-08
ORG =5.184E+01  SFIDE=3.267E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   30967.8
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.862E-01  CYAN =8.879E-02  O&G =6.525E-01  PHEN=1.517E-02  TSS =1.218E+01
SFIDE=1.540E-02  FLIDE=1.036E+00  TI  =0.0        ZN  =6.754E-02  NITR=5.387E-01
PB   =3.881E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.709E+00  BOD  =8.354E-02  HMET=6.911E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.308 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=9.434E+08  PET=1.847E+08  GAS=5.259E+08  ELEC=8.931E+08  HELEC=2.739E+07
OTH =5.520E+06  TOT=2.580E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.066E+02  NOX =2.150E+03  SOX =1.410E+01  HC=1.231E+01  CO=1.620E+02
ALD =1.010E-01  DACD=1.498E-03  HMET=1.278E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1549778.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.320E-01  TSS=1.143E+01  SFIDE=0.0        FLIDE=1.224E-02
TFE =5.463E-01  DFE=2.221E-01  ZN =1.155E-04  PB   =9.284E-05  MN   =1.844E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =8.101E+00  HMET =2.496E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.084E+02  NOX  =5.135E+00  SOX=1.144E+02  HC  =1.908E+02  CO =1.192E+03
GFL =2.872E+00  PFL  =2.470E+00  AMM=5.558E-01  HMET=3.510E-01  ALD=1.065E-08
ORG =5.184E+01  SFIDE=3.267E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   30555.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.846E-01  CYAN =8.875E-02  O&G =6.525E-01  PHEN=1.513E-02  TSS =1.217E+01
SFIDE=1.533E-02  FLIDE=1.021E+00  TI  =0.0        ZN  =6.772E-02  NITR=5.402E-01
PB   =3.884E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =8.730E+00  BOD  =8.354E-02  HMET=6.911E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.309 Commuter Rail-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=1.079E+09  PET=2.224E+08  GAS=5.643E+08  ELEC=8.647E+08  HELEC=5.284E+07
OTH =4.364E+06  TOT=2.790E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=2.087E+02  NOX =2.181E+03  SOX =1.430E+01  HC=1.272E+01  CO=1.643E+02
ALD =1.025E-01  DACD=1.973E-03  HMET=1.266E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 1573868.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=2.145E-01   TSS=1.439E+01   SFIDE=0.0        FLIDE=1.714E-02
TFE =6.477E-01  DFE=3.745E-01   ZN =1.548E-04   PB   =1.198E-04  MN   =1.870E-01
COD =0.0        CU =0.0         TDS=5.134E+01   BOD  =8.048E+00  HMET =2.811E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=3.532E+02  NOX  =5.135E+00  SOX=1.160E+02  HC  =1.921E+02  CO =1.206E+03
GFL =4.725E+00  PFL  =4.115E+00  AMM=6.135E-01  HMET=3.971E-01  ALD=1.065E-08
ORG =5.184E+01  SFIDE=3.229E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   32272.1
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =5.823E+00  CYAN =1.021E+00  O&G =1.088E+00  PHEN=1.517E-01  TSS =2.297E+01
SFIDE=1.472E-02  FLIDE=3.711E+00  TI  =0.0        ZN  =6.721E-02  NITR=5.359E-01
PB   =3.870E-03  MN   =0.0        COD =6.573E-01  AL  =3.795E-01  CU  =1.084E-03
TDS  =1.383E+01  BOD  =2.958E-01  HMET=6.830E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.310 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 1980, All Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=7.552E+08  PET=1.662E+08  GAS=3.885E+08  ELEC=6.143E+08  HELEC=3.242E+07
OTH =1.339E+06  TOT=1.958E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.293E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.315E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  989413.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.320E-01  TSS=9.017E+00  SFIDE=0.0        FLIDE=1.142E-02
TFE =4.069E-01  DFE=2.353E-01  ZN =1.032E-04  PB   =7.989E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=3.423E+01  BOD  =4.648E+00  HMET =1.653E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.072E+02  NOX  =3.423E+00  SOX=7.351E+01  HC  =1.245E+02  CO =7.615E+02
GFL =2.285E+00  PFL  =1.981E+00  AMM=2.549E-01  HMET=2.647E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19736.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.657E+00  CYAN =6.423E-01  O&G =7.037E-01  PHEN=9.560E-02  TSS =1.382E+01
SFIDE=9.806E-03  FLIDE=1.995E+00  TI  =0.0        ZN  =4.427E-02  NITR=3.530E-01
PB   =2.550E-03  MN   =0.0        COD =4.815E-01  AL  =2.890E-01  CU  =8.258E-04
TDS  =8.644E+00  BOD  =1.972E-01  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL =0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0         TOT=0.0
```

Table B.311 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=6.289E+08  PET=1.177E+08  GAS=3.208E+08  ELEC=5.434E+08  HELEC=2.271E+07
OTH =1.540E+06  TOT=1.637E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.292E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.307E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  988638.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.315E-01  TSS=9.016E+00  SFIDE=0.0        FLIDE=1.142E-02
TFF =4.069E-01  DFF=2.353E-01  ZN =9.384E-05  PB   =7.262E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=3.423E+01  BOD  =4.648E+00  HMET =1.653E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.988E+02  NOX  =3.423E+00  SOX=7.344E+01  HC  =1.245E+02  CO =7.615E+02
GFL =1.912E+00  PFL  =1.651E+00  AMM=2.549E-01  HMET=2.472E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19394.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.657E+00  CYAN =6.423E-01  O&G =7.037E-01  PHEN=9.560E-02  TSS =1.391E+01
SFIDE=9.806E-03  FLIDE=1.805E+00  TI  =0.0        ZN  =4.426E-02  NITR=3.530E-01
PB   =2.544E-03  MN   =0.0        COD =5.493E-01  AL  =3.456E-01  CU  =9.874E-04
TDS  =8.663E+00  BOD  =1.972E-01  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.312 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=6.273E+08  PET=1.277E+08  GAS=3.510E+08  ELEC=5.747E+08  HELEC=1.976E+07
OTH =2.002E+06  TOT=1.703E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.292E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.301E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  988057.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.599E-02  TSS=7.251E+00  SFIDE=0.0        FLIDE=8.160E-03
TFE =3.481E-01  DFE=1.471E-01  ZN =7.699E-05  PB   =6.189E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =4.620E+00  HMET =1.423E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.931E+02  NOX  =3.423E+00  SOX=7.338E+01  HC  =1.245E+02  CO =7.615E+02
GFL =1.664E+00  PFL  =1.431E+00  AMM=2.549E-01  HMET=2.340E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19166.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.451E-01  CYAN =5.883E-02  O&G =4.222E-01  PHEN=9.806E-03  TSS =7.116E+00
SFIDE=9.806E-03  FLIDE=6.497E-01  TI  =0.0        ZN  =4.425E-02  NITR=3.530E-01
PB   =2.540E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =5.193E+00  BOD  =5.569E-02  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.313 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 1990, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=6.899E+08  PET=1.471E+08  GAS=3.763E+08  ELEC=5.692E+08  HELEC=3.410E+07
OTH =1.159E+06  TOT=1.818E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.293E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  OACD=4.896E-05  HMET=7.315E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  989413.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.320E-01  TSS=9.017E+00  SFIDE=0.0        FLIDE=1.142E-02
TFE =4.069E-01  DFE=2.353E-01  ZN =1.032E-04  PB   =7.989E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=3.423E+01  BOD  =4.648E+00  HMET =1.653E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.174E+02  NOX  =3.423E+00  SOX=7.351E+01  HC  =1.245E+02  CO =7.615E+02
GFL =2.741E+00  PFL  =2.384E+00  AMM=2.549E-01  HMET=2.647E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   20154.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.657E+00  CYAN =6.423E-01  O&G =7.037E-01  PHEN=9.560E-02  TSS =1.370E+01
SFIDE=9.806E-03  FLIDE=2.227E+00  TI  =0.0        ZN  =4.427E-02  NITR=3.530E-01
PB   =2.550E-03  MN   =0.0        COD =3.985E-01  AL  =2.199E-01  CU  =6.283E-04
TDS  =8.644E+00  BOD  =1.972E-01  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.314 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set A

```
TOTAL BTU BY FUEL TYPE
COAL=6.394E+08  PET=9.831E+07  GAS=3.011E+08  ELEC=5.527E+08  HELEC=1.694E+07
OTH =1.747E+06  TOT=1.611E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.292E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.307E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  988638.6
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.638E-02  TSS=7.252E+00  SFIDE=0.0        FLIDE=8.160E-03
TFE =3.481E-01  DFF=1.471E-01  ZN =8.323E-05  PB   =6.691E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =4.620E+00  HMET =1.423E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.988E+02  NOX  =3.423E+00  SOX=7.344E+01  HC  =1.245E+02  CO =7.615E+02
GFL =1.912E+00  PFL  =1.651E+00  AMM=2.549E-01  HMET=2.472E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19394.6
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.451E-01  CYAN =5.883E-02  O&G =4.222E-01  PHEN=9.806E-03  TSS =7.120E+00
SFIDE=9.806E-03  FLIDE=6.569E-01  TI  =0.0        ZN  =4.426E-02  NITR=3.530E-01
PB   =2.544E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =5.179E+00  BOD  =5.569E-02  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.315 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set B

```
TOTAL BTU BY FUEL TYPE
COAL=5.774E+08  PET=1.146E+08  GAS=3.306E+08  ELEC=5.538E+08  HELEC=1.588E+07
OTH =2.393E+06  TOT=1.592E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.292E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.301E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  988057.2
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=7.599E-02  TSS=7.251E+00  SFIDE=0.0        FLIDE=8.160E-03
TFE =3.481E-01  DFE=1.471E-01  ZN =7.699E-05  PB   =6.189E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=0.0        BOD  =4.620E+00  HMET =1.423E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=1.931E+02  NOX  =3.423E+00  SOX=7.338E+01  HC  =1.245E+02  CO =7.615E+02
GFL =1.664E+00  PFL  =1.431E+00  AMM=2.549E-01  HMET=2.340E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   19166.9
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =2.451E-01  CYAN =5.883E-02  O&G =4.222E-01  PHEN=9.806E-03  TSS =7.116E+00
SFIDE=9.806E-03  FLIDE=6.497E-01  TI  =0.0        ZN  =4.425E-02  NITR=3.530E-01
PB   =2.540E-03  MN   =0.0        COD =1.765E-07  AL  =0.0        CU  =0.0
TDS  =5.193E+00  BOD  =5.569E-02  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.316 Commuter Rail Car-Non-Self Propelled Vehicle Energy and Residuals, 2000, Technology Set C

```
TOTAL BTU BY FUEL TYPE
COAL=6.678E+08  PET=1.371E+08  GAS=3.519E+08  ELEC=5.362E+08  HELEC=3.062E+07
OTH =2.178E+06  TOT=1.725E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=1.293E+02  NOX =1.370E+03  SOX =8.989E+00  HC=7.376E+00  CO=1.032E+02
ALD =6.431E-02  DACD=4.896E-05  HMET=7.315E-01
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS=  989413.8
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=1.320E-01  TSS=9.017E+00  SFIDE=0.0        FLIDE=1.142E-02
TFE =4.069E-01  DFE=2.353E-01  ZN =1.032E-04  PB   =7.989E-05  MN   =1.177E-01
COD =0.0        CU =0.0        TDS=3.423E+01  BOD  =4.648E+00  HMET =1.653E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=2.174E+02  NOX  =3.423E+00  SOX=7.351E+01  HC  =1.245E+02  CO =7.615E+02
GFL =2.741E+00  PFL  =2.384E+00  AMM=2.549E-01  HMET=2.647E-01  ALD=1.065E-08
ORG =3.456E+01  SFIDE=1.863E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   20154.3
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =3.657E+00  CYAN =6.423E-01  O&G =7.037E-01  PHEN=9.560E-02  TSS =1.370E+01
SFIDE=9.806E-03  FLIDE=2.227E+00  TI  =0.0        ZN  =4.427E-02  NITR=3.530E-01
PB   =2.550E-03  MN   =0.0        COD =3.985E-01  AL  =2.199E-01  CU  =6.283E-04
TDS  =8.644E+00  BOD  =1.972E-01  HMET=3.942E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
```

Table B.317 Diesel/Electric Locomotive Energy and Residuals, All Years and Technology Sets

```
TOTAL BTU BY FUEL TYPE
COAL=2.161E+09  PET=6.977E+08  GAS=1.775E+09  ELEC=1.854E+09  HELEC=8.679E+07
OTH =4.086E+07  TOT=6.644E+09
TOTAL AIR RESIDUALS - EXTRACTION(LBS)
PART=8.424E+02  NOX =6.326E+03  SOX =1.616E+02  HC=5.180E+01  CO=6.843E+02
ALD =5.818E+01  DACD=2.508E-02  HMET=1.019E+00
TOTAL SOLIDS - EXTRACTION(LBS)
SOLIDS= 4550698.0
TOTAL WATER RESIDUALS - EXTRACTION(LBS)
CYAN=0.0        O&G=6.128E-01  TSS=2.049E+02  SFIDE=1.012E-03  FLIDE=1.361E-01
TFE =1.866E+00  DFE=1.079E+00  ZN =1.193E-03  PB   =1.479E-03  MN   =5.360E-01
COD =3.040E+02  CU =0.0        TDS=9.228E+02  BOD  =1.854E+02  HMET =3.709E-02
ARS =0.0        CD =0.0
TOTAL AIR RESIDUALS - MFG(LBS)
PART=8.786E+02  NOX  =3.294E+01  SOX=3.974E+02  HC  =7.887E+02  CO =3.420E+03
GFL =6.685E+00  PFL  =1.131E+01  AMM=3.847E+00  HMET=3.329E+00  ALD=1.065E-08
ORG =8.090E+02  SFIDE=2.351E+02
TOTAL SOLIDS - MFG(LBS)
SOLIDS=   70688.0
TOTAL WATER RESIDUALS - MFG(LBS)
AMM  =1.680E+01  CYAN =2.934E+00  O&G =3.023E+00  PHEN=4.532E-01  TSS =3.653E+01
SFIDE=3.358E-02  FLIDE=5.829E+00  TI  =0.0        ZN  =1.651E-01  NITR=1.307E+00
PB   =9.747E-03  MN   =0.0        COD =2.532E+00  AL  =7.738E-01  CU  =2.211E-03
TDS  =4.702E+01  BOD  =1.676E+00  HMET=4.975E+00  MO  =0.0        ARS =0.0
NI   =0.0        OTH  =0.0
TOTAL BATTERY BTU BY FUEL TYPE
COAL=0.0        PET=0.0        GAS=0.0        ELEC=0.0        HELEC=0.0
OTH =0.0        TOT=0.0
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