SUBCHAPTER 4.5

SOLID/HAZARDOUS WASTE MANAGEMENT

4.5 SOLID/HAZARDOUS WASTE

4.5.1 INTRODUCTION

This subchapter identifies potential solid/hazardous waste impacts that may be generated by implementing the 2003 AQMP. The potential impacts to the generation of solid and hazardous waste associated with the implementation of the 2003 AQMP are described below.

The analysis of solid/hazardous waste impacts assumes that safety and disposal procedures required by various agencies in the state of California will provide reasonable precautions against the improper disposal of hazardous wastes in a municipal waste landfill. Because of state and federal requirements, some facilities are attempting to reduce or minimize the generation of solid and hazardous waste by incorporating source reduction technologies to reduce the volume or toxicity of waste generated, including improving operating procedures, using less hazardous or non-hazardous substitute materials, and upgrading or replacing inefficient processes.

4.5.2 2003 AQMP CONTROL MEASURES WITH SOLID/ HAZARDOUS WASTE IMPACTS

Table 4.5-1 lists the 2003 AQMP control measures with potential adverse solid and hazardous waste impacts through the addition of materials requiring disposal.

4.5.3 SIGNIFICANCE CRITERIA

Impacts to solid/hazardous waste facilities will be considered significant if any of the following occur:

- Published national, state, or local standards relating to solid waste or litter control are exceeded.

- The generation and disposal of solid or hazardous waste, when combined with existing waste generation, exceeds the capacity of designated landfills.

TABLE 4.5-1

Control Measures with Potential Solid/Hazardous Waste Impacts

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Impact
MEASURES TO BE IMPLEMENTED BY THE SCAQMD			
CMB-09	Emission Reductions from Petroleum Refinery FCCUs	Add on control equipment	Potential impact on solid and hazardous waste. Dry electrostatic precipitator.
CMB-10	Additional Reductions for NOx RECLAIM	Add on ctrl. equip., process changes, purchase RTCs	Potential impact on solid and hazardous waste
FUG-05	Emission Reductions from Fugitive Sources	Enhanced inspection & maintenance, leakless valves, add on control equipment	Potential increases in solid waste
PRC-03	Emission Reductions from Restaurant Operations	Add on control equipment, equipment modification	Potential increases in solid waste
WST-01	Emission Reductions from Livestock Waste	Removal and disposal of manure	Potential increases in solid waste
WST-02	Emission Reductions from Composting	Best management practices. Add on control equipment	Potential increases in solid waste
MSC-04	Emission Reductions from Miscellaneous Ammonia Sources	Add on control equipment	Additional controls and alternatives to ammonia use.
MSC-06	Emission Reductions From Wood Burning Fireplaces and Wood Stoves	Certified wood stoves or fireplace inserts, incentive programs, and public outreach	Potential increase in solid waste.
MSC-08	Further Emission Reductions from Large VOC Sources	Emission Reduction Plan; Controls based on specific source categories	Potential increase in solid and hazardous wastes
FSS-06	Further Emission Reductions From In-Use Off-Road Vehicles and Equipment	Add on control equipment and use of alternative fuels.	Potential increase in solid waste
TCB-01	Transportation Conformity Budget Backstop Control Measures	PM10 reductions from fugitive dust sources, use of particulate traps, and oxidation catalyst systems on mobile sources, VMT reduction strategies	
LTM-ALL	Long-Term Control Measures	Near-zero or zero VOC coating and solvent formulations, add-on controls, inspection & maintenance, process changes	Potential increases in solid waste
MEASURES TO BE CONSIDERED BY OTHER AGENCIES			
LT/MED-DUTY-1	Replace or Upgrade Emission Control Systems on Existing Passenger Vehicles – Pilot Program.	Replace O2 sensors & catalyst	Potential increase in solid waste

TABLE 4.5-1 (Continued)

Control Measures with Potential Solid/Hazardous Waste Impacts

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Impact
ON-RD HVY DUTY-3	Pursue Approaches to Clean Up the Existing Truck/Bus Fleet	Reduce emissions from existing heavy-duty diesel vehicles through a mix of strategies	Increase scrapping of diesel engines and vehicles, increased waste from spent catalyst, and impacts due to handling of collected particulate matter
OFF-RD CI-1	Pursue Approaches to Clean Up the Existing Heavy-Duty Off-Road Equipment Fleet (Compression Ignition Engines) – Retrofit Controls	Engine modifications, add on control technology, alternative clean fuels	Increase scrapping of diesel engines and vehicles, increased waste from spent catalyst, and impacts due to handling of collected particulate matter
OFF-RD CI-2	Registration and Inspection Program for Existing Off-Road Equipment to Detect Excess Emissions (Compression Ignition Engines)	Off-road registration/in-use compliance test program	Potential increase in disposal of faulty emission control parts
OFF-RD LSI-1	Set Lower Emission Standards for New Off-Road Gas Engines (Spark Ignited Engines 25 hp and Greater)	Use of improved catalyst	Increased waste from spent catalyst
OFF-RD LSI-2	Clean up Off-Road Gas Equipment Fleet Through Retrofit Controls and New Emission Standards (Spark Ignition Engines 25 hp or Greater)	Add on control technology, use of electricity	Potential increase in forklift scrapping and battery disposal
SMALL OFF-RD-2	Set Lower Emission Standards for New Non-Handheld Small Engines and Equipment (Spark Ignited Engines Under 25 hp such as Lawnmowers)	Engine modifications, control of evaporation emissions	Potential increased waste from spent catalyst
MARINE-1	Pursue Approaches to Clean Up the Existing Harbor Craft Fleet – Cleaner Engines and Fuels	Retrofit control technology, Add on control devices, Alternative Clean Fuels, Electrification	Increased waste from spent catalyst, and impacts due to handling of collected particulate matter
MARINE-2	Pursue Approaches to Reduce Land-Based Emissions at Ports – Alternative Fuels, Cleaner Engines, Retrofit Controls, Electrification, Education Programs, Operational Controls	Retrofit control. Tech., Alternative Clean Fuels, electrification of diesel equip., operational changes	Increased waste from spent catalyst, and impacts due to handling of collected particulate matter. Filter ash and spent filter may be a hazardous waste. Potential increase in engine scrapping
FVR-1	Increase Recovery of Fuel Vapors from Aboveground Storage Tanks	Add on control technology	Increased waste from spent carbon

TABLE 4.5-1 (Continued)

Control Measures with Potential Solid/Hazardous Waste Impacts

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Impact
FVR-2	Recover Fuel Vapors from Gasoline Dispensing at Marinas	Add on control technology	Increased waste from spent carbon
Long Term	Light/Medium Duty Vehicles – Provide incentives for voluntary passenger vehicle retirement	Retirement of older vehicles	Potential increase in solid waste
	On-Road Heavy Duty Vehicles - Provide incentives for cleaner trucks and buses, including school buses. On-board diagnostics, in-use testing.	Reduce emissions through a mix of strategies	Potential increase in solid waste
	Off-Road Class 1 Vehicles - Provide incentives for cleaner off-road equipment. Lower emission standards for new off-road compression ignition engines.	Engine modifications, add on control technology, alternative clean fuels	Potential increase in solid waste
	Ports/Marine – Pursue advanced technologies and innovative strategies – alternatives for dockside power and propulsion in/out of port, operational controls Cleaner fuels, incentives for cleaner ships, smoke limits.	Operational controls, cleaner fuels, cold ironing, retrofit controls	Potential increase in solid waste
	Airports - Pursue approaches to reduce emissions from vehicles traveling to and from airports. Reduce emissions from jet aircraft through approaches such as more stringent engine standards,, retrofit controls, cleaner fuel, and applying standards to non-tactical military aircraft	Alternative fuels, particulate filters, infrastructure for alternative fuel/ electric vehicles, entry fees, increased transport options	Potential increase in solid waste
	Railroad/Locomotives -- Pursue tighter federal emission standards for locomotives, more stringent emission standards for new and remanufactured locomotive engines	Accelerate intro. of new, lower emitting locomotive engines, add on controls, alternative fuels	Potential increase in solid waste

TABLE 4.5-1 (Concluded)

Control Measures with Potential Solid/Hazardous Waste Impacts

Control Measures	Control Measure Description (Pollutant)	Control Methodology	Impact
	Diesel Engines - Set toxics standard for existing diesel fueled engines - over 50hp; Set toxics standard for existing portable diesel engines; Set toxics standard for new and existing small stationary diesel engines - under 50hp; Set toxics standard for diesel fueled refrigeration units on trucks	Retrofit technology, electrification, use of alternate fuels, particulate filters	Potential increase in solid waste
	Consumer Products - Future consumer products regulations	Reformulation/alternative applications	Potential increase in solid or hazardous waste
CONCEPTUAL IDEAS FOR POSSIBLE CONSIDERATION AS LONG-TERM MEASURES			
Conceptual Control Measures	Control of Emissions from Port Operations	Cold-ironing, electrification, diesel truck retrofit, low sulfur diesel	Potential increase in solid waste

4.5.4 POTENTIAL SOLID/HAZARDOUS WASTE IMPACTS AND MITIGATION MEASURES

Spent Batteries from Electric Vehicles

PROJECT-SPECIFIC IMPACT: The 2003 AQMP projects substantial penetration of fuel cell, electric and electric hybrid vehicles by 2010 as part of mobile source pollution control measures. The CARB and U.S. EPA control measures include additional requirements for Low Emission Vehicles and Zero Emission Vehicles (LT/MED DUTY-1, and OFF-RD LSI-1, and some of the long-term control measures). The batteries that could power these vehicles have useful lives similar to or less than the life of a vehicle. Since some batteries contain toxic materials, the increased use of batteries may result in an incremental increase in solid/hazardous waste impacts. In addition, environmental impacts could occur if batteries were disposed of in an unsafe manner, such as illegal dumping or by disposal in an unlined landfill.

It is difficult to predict in detail what the battery and fuel cell technologies of the future will be. It is also difficult to predict how often batteries will need replacement as this mainly depends on the battery type, the nature, and duration of its use, etc. Currently most battery packs' useful life is about three years. Replacement cost for the batteries depends on the type and number of batteries but could cost thousands of dollars (SCAQMD, 1997).

Most battery and fuel cell technologies employ materials that are recyclable. Additionally, both regulatory requirements and market forces encourage recycling. The following is a brief listing of some of the more important Federal and California regulations that have created incentives for the proper disposal and recycling of EV battery packs:

- The federal Battery Act promulgated in 1996 requires that each regulated battery be labeled with a recycling symbol. NiCad batteries must be labeled with the words “NiCad” and the phrase “Battery must be recycled or disposed of properly.” Lead-acid batteries must be labeled with the words “Lead,” “Return,” and “Recycle.”

- Current California and federal regulations require ZEV manufacturers to take into account the complete life-cycle of car batteries and to plan for safe disposal and/or recycling of battery materials.

- The California Health and Safety Code does not allow the disposal of lead-acid batteries at a solid waste facility or on or in any land, surface waters, water courses, or marine waters. Legal disposal methods for used lead-acid batteries are to recycle/reuse the battery or to dispose of it at a hazardous waste disposal facility. A lead-acid battery dealer is required to accept spent batteries when a new one is purchased.

- California businesses may take a 40 percent tax credit for the cost of equipment used to manufacture recycled products (Kimball, 1992).

- California Public Resources Code requires state agencies to purchase car batteries made from recycled material.

Recycling of lead-acid and nickel-cadmium batteries is a well-established activity. Eighty percent of lead consumed in the United States is used to produce lead-acid batteries, and the lead recovery rate from batteries is approximately 80 to 90 percent. According to the Lead-Acid Battery Consortium, 95 to 98 percent of all battery lead is recycled.

The Universal Waste Rule requires that spent batteries exhibiting hazardous waste characteristics and that are not recycled need to be managed as hazardous waste. This includes lead-acid and NiCad batteries. There are currently three Class I (hazardous waste) landfills located in California. Chemical Waste Management Corporation in Kettleman City is a treatment, storage and disposal facility that has a capacity of 6.5 million cubic yards. At current disposal rates, this capacity would last for approximately 18 years (personal communication, Terry Yarbough). Safety Kleen operates a Class I facility in Buttonwillow with a remaining permitted capacity of about 10 million cubic yards. In addition, landfill disposal is available at the Safety Kleen facility located in Westmoreland. Hazardous wastes can also be transported to permitted facilities outside of California.

Because most EV batteries and are recycled, it is unlikely that the increase in battery use would significantly adversely affect landfill capacity in California. As mentioned earlier, electric batteries generally hold significant residual value, and 95 to 98 percent of all lead-acid batteries are recycled. In addition, the electric batteries that would power EVs are packaged in battery packs and cannot be as easily disposed of as a single 12-volt conventional vehicle battery. It should be noted that the increased operation of EVs associated with the implementation of the 2003 AQMP may actually result in a reduction of the amount of solid/hazardous waste generated in the SCAQMD's jurisdiction. EVs do not require the various oil and gasoline filters that are required by vehicles using internal combustion engines. Furthermore, EVs do not require the same type or amount of engine fluids (oil, antifreeze, etc.) that are required by vehicles using internal combustion engines.

Illegal or improper disposal of electric batteries could result in significant solid waste impacts by allowing hazardous wastes to be disposed in municipal landfill. The increase use of electric batteries will require efforts at preventing disposal of spent batteries in municipal landfills or via illegal dumping. Two lead-acid battery recycling facilities are located within the district, which helps to increase the potential for recycling of lead-acid batteries. The increase use of electric batteries will require greater efforts at preventing disposal of spent batteries in unlined municipal landfills or via illegal dumping.

PROJECT-SPECIFIC MITIGATION: Recycling of lead-acid and NiCad batteries is already a well established activity. Even though batteries are recyclable in principle, recycling is still not a certainty. Therefore, the following incentives will help ensure recycling.

SHW 1: Require leasing, deposit or rebate programs for electric batteries. Leasing and rebate programs can both be effective measures to increase the rate of recovery of spent batteries, and both types of measures are already proven in practice. Deposit programs can also achieve the same goals.

SHW 2: Require spent battery exchange for battery replacement. Require that ZEV service stations sell or install new batteries only on condition that they receive the spent batteries in exchange.

The above mitigation measures are expected to minimize any increase battery disposal impacts to less than significant.

<u>Potential Solid Waste Impacts due to Air Pollution Control Technologies</u>

PROJECT-SPECIFIC IMPACT: Table 4.5-1 identifies those proposed control measures that may have potential project specific impacts on solid waste due to the addition of pollution control equipment which may need disposal and replacement. It is difficult to quantify the number of facilities that would employ these types of equipment, the rate of disposal necessary to maintain the equipment, type of waste generated by the equipment (i.e., hazardous or non-hazardous) and the timing by which these technologies would come into use.

Particulate matter collected on filters and from electrostatic precipitators is expected to be small. Diesel particulate filters are estimated to collect about 10 to 150 grams of material per vehicle per year (CARB, 2002) which is expected to be considered as hazardous waste. The amount of material collected from these types of control equipment is expected to be minor as described in the following paragraphs and could be handled within the capacity of existing disposal facilities.

The diesel PM10 filter system consists of a filter positioned in the exhaust stream designed to collect a significant fraction of the PM10 emissions while allowing the exhaust gases to pass through the system. Since the volume of PM10 generated by a diesel engine is sufficient to fill up and plug a reasonably sized filter over time, some means of disposing of this trapped PM10 must be provided. The most promising means of disposal is to burn or oxidize the PM10 in the filter, thus regenerating, or cleansing, the filter.

A complete filter system consists of the filter and the means to facilitate the regeneration if not of the disposable type. The exhaust temperature of diesels is not always sufficient to initiate regeneration in the filter. A number of techniques are available to bring about regeneration of filters. It is not uncommon for some of these various techniques to be used in combination. Some of these methods include:

- Using a catalyst coated on the filter element. The application of a base or precious metal coating applied to the surface of the filter reduces the ignition temperature necessary for oxidation of the particulate;

- Using a NOx conversion catalyst upstream of the filter to facilitate oxidation of NO to NO_2 which adsorbs on the collected PM10, substantially reducing the temperature required to regenerate the filter;

- Using fuel-borne catalysts to reduce the temperature required for ignition of the accumulated material;

- Throttling the air intake to one or more of the cylinders, thereby increasing the exhaust temperature;

- Using fuel burners, electrical heaters, or combustion of atomized fuel by catalyst to heat the incoming exhaust gas to a temperature sufficient to ignite the PM10;

- Using periodically compressed air flowing in the opposite direction of the PM10 from the filter into a collection bag which is periodically discarded or burned; and

- Throttling the exhaust gas downstream of the filter. This method consists of a butterfly valve with a small orifice in it. The valve restricts the exhaust gas flow, adding back pressure to the engine, thereby causing the temperature of the exhaust gas to rise and initiating combustion.

Based on the above considerations no significant adverse solid/hazardous waste impacts are anticipated to occur from the use of particulate traps.

The goal of the 2003 AQMP is to improve air quality, some types of air pollution control equipment have the potential to create cross-media impacts. For example, removing pollutants from equipment exhaust streams may produce liquid or solid wastes that may require further treatment or disposal to POTWs or landfills, respectively. Specifically, hazardous and non-hazardous waste maybe generated by some types of air pollution control equipment such as electrostatic precipitators, carbon adsorption, oxidation devices, wet scrubbers, baghouse, and filtration equipment. Several control measures have been proposed in the 2003 AQMP which may require the use of these types of pollution control equipment (see Table 4.5-1).

State law requires hazardous waste generators to attempt to recycle their wastes before disposing them. OEHHA has implemented a hazardous waste exchange program to promote the use reuse and exchange of hazardous wastes. The program is designed to assist generators of hazardous wastes to recycle their wastes and encourage the reuse of the wastes. The DTSC also publishes a directory catalog of industrial waste recyclers annually so that industries will know where to buy, sell, or exchange their wastes.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to air pollution control technologies as part of the 2003 AQMP so no mitigation measures are required.

<u>Carbon Adsorption</u>

PROJECT-SPECIFIC IMPACT: Several control measures could encourage the use of carbon adsorption as air pollution control equipment including FUG-05, MSC-08, FVR-1, and FVR-2. The amount of solid waste, which may be generated by the carbon adsorption process would depend on the number of carbon adsorbers installed, the operating characteristics, and the frequency of carbon replacement. Most of the control measures have alternative methods of compliance, e.g., reformulation of materials, so that all facilities would not be expected to use carbon adsorption to comply.

If carbon adsorption systems are used, the amount of hazardous waste generated on an annual basis is expected to be minimal. Most activated carbon used in carbon adsorption control devices is reclaimed and reactivated, resulting in negligible impacts on solid waste disposal facilities. Activated carbon can have a lifetime of five to 10 years; however, the operating characteristics of the control device may result in a shorter lifetime.

Spent carbon is usually recycled and reused rather than disposed in landfills. Most facilities contract out with vendors that take the spent carbon and deliver regenerated carbon. Another alternative to the land disposal of regenerated carbon is to burn the spent carbon in a thermal incinerator. With thermal incineration, the organic materials contained in the carbon are oxidized to carbon dioxide, water, and in most cases, harmless combustion by-products. Incineration destroys the toxic constituents and significantly reduces the volume of carbon to be disposed of, thus reducing solid waste impacts. The disadvantage of incineration is that without additional add-on control devices, there may be an increase in criteria pollutant emissions. Therefore, the solid waste impacts resulting from the use of carbon adsorption are expected to be less than significant.

Further, it is not expected that carbon adsorption will be used in every case where it is listed as a control option. It is expected that facilities will continue to choose other more cost-effective options to comply with control measures.

PROJECT-SPECIFIC MITIGATION: The following mitigation measure is included to ensure that solid waste impacts as a result of carbon adsorption do not cause significant impacts.

SHW3: Recycling and reusing activated carbon should be required to minimize the amount of spent carbon waste being transferred to landfills.

<u>Particulate Traps/Prefilters/Filter/HEPA Filters</u>

PROJECT-SPECIFIC IMPACT: A number of control measures in the 2003 AQMP could require the collection and disposal of additional particulate matter including CMB-09, CMB-10, PRC-03, WST-02, MSC-06, FSS-06, TCB-01, LT/MED-DUTY-1, ON-RD HVY DUTY-3, OFF-RD CI-1, OFF-RD CI-2, MARINE-1, MARINE-2, and some of the long-term control measures. These measures could result in increased collection of particulate matter that would then need to be disposed.

Baghouses, prefilters, filters, and HEPA filters collect particulate emissions from stationary and mobile sources of particulate emissions. These types of filtration control equipment can effectively remove particulate matter, including heavy metals, asbestos, as well as other toxic and nontoxic compounds.

Polytetrafluoroethylene (PTFE) membranes or HEPA filters can increase a system's removal efficiency up to 99.9 percent. In general, as particulate size decreases, the surface area to volume ratio increases, thus increasing the capacity of these filters to adsorb smaller particles (including hazardous materials). An increase in the use of membranes and filters may increase solid waste requiring disposal in landfills over what would be produced if the AQMP were not adopted. In some cases, the waste generated will be hazardous (e.g., the collection of toxic emissions). The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter are expected to be small as the amount of material collected is small. Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to filtration control technologies as part of the 2003 AQMP so no mitigation measures are required.

Catalytic Oxidation

PROJECT-SPECIFIC IMPACT: The 2003 AQMP could result in the increased use of catalytic oxidation to control emissions. The following control measures could rely on catalytic oxidation technologies for emission control including TCB-01, LT/MED-DUTY-1, ON-RD HVY DUTY-3, OFF-RD CI-1, OFF-RD LSI-1, SMALL OFF-RD-2, MARINE-1, and MARINE-2. Catalytic oxidation beds generally use a precious metal to add in the conversion of air pollutants. Catalytic oxidizers require periodic replacement of the catalyst bed. The expected life of the catalyst is approximately three to five years, depending on the concentration of materials and type of exhaust flows controlled. Metals used in the catalyst are generally recovered because they are made from precious and valuable metals (e.g., platinum and palladium). Metals can be recovered from approximately 60 percent of the spent catalyst generated from the operation of catalytic oxidizers (SCAQMD, 1997). These metals could then be recycled. The remaining material would most likely need to be disposed of at a hazardous waste landfill.

If the catalyst is not hazardous, jurisdiction for its disposal then shifts to local agencies such as regional water quality control boards or county environmental agencies. The RWQCB has indicated that if a spent catalyst is not considered a hazardous waste, it would probably be considered a Designated Waste. A Designated Waste is characterized as a non-hazardous waste consisting of, or containing pollutants that, under ambient environmental conditions, could be released at concentrations in excess of applicable water objectives, or which could because degradation of the waters of the state. The type of landfill that the material is disposed at will depend upon its final waste designation. Due to the recycling of catalysts used in catalytic oxidation, no significant impacts on waste disposal are expected.

An increase in the use of electric vehicles would result in a decrease in the number of catalytic converters on vehicles since catalytic converters are not required for electric vehicles. This would reduce the number of catalytic converters that would require recycling/disposal.

PROJECT-SPECIFIC MITIGATION: No significant solid/hazardous waste impacts were identified for solid waste impacts due to catalytic oxidation control technologies as part of the 2003 AQMP so no mitigation measures are required.

Early Retirement of Equipment

PROJECT-SPECIFIC IMPACT: Control Measures MSC-06 could result in the replacement of wood fireplaces resulting in the disposal of old fireplaces. LT/MED DUTY-1 would replace oxygen sensors and catalysts on a more frequent basis potentially resulting in the increased generation of wastes. ON-RD HVY DUTY-3, OFF-RD CI-1, OFF-RD CI-2, OFF-RD LSI-2 and some of the long-term control measures could result in the early retirement of equipment (e.g., diesel engines and vehicles, faulty emission control parts, and older forklifts). Solid waste impacts could occur since the older equipment would be taken out of service and scrapped and disposed of in district landfills.

Approximately 80 percent of a retired vehicle can be recycled and reused in another capacity. Batteries, catalytic converters, tires, and other recoverable materials (e.g., metal components) are removed and the rest of the vehicle is shredded. The shredded material is then sent for recovery of metal content. Therefore, the amount of solid waste landfilled as a result of the proposed measures would be smaller than the size of the vehicle. Additionally, there are a limited number of vehicles that can be scrapped per year. It is expected that diesel engines and forklifts could also be recycled for metal content, or rebuilt and sold to other areas. These vehicles would be scrapped in the near future, regardless of the AQMP control measures as they are older vehicles or have older components. Further, these control measures are not expected to mandate that older vehicle, engines, forklifts or other equipment be scrapped. The control measures are expected to allow a number of different control methods to comply with the required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Based on the above, the increase in solid waste is expected to be within the district's permitted capacity of over 100,000 tons per day so that no significant impacts would be expected.

The California Integrated Waste Management Act of 1989 (AB 939) requires cities and counties in California to reduce the amount of solid waste disposed in landfills and transformed by 25 percent by 1995 and by 50 percent by 2000, through source reduction, recycling and composting activities. Many cities and counties have not met these waste reduction goals. The generation of additional waste in the 2003 AQMP could impact the abilities of cities and counties to further reduce wastes. However, as discussed above the increase in solid waste that is expected to be diverted to a landfill is small and many of the waste streams are recyclable. Therefore, the proposed project is not expected to have adverse impacts on landfills.

PROJECT-SPECIFIC MITIGATION: No significant impacts on solid/hazardous waste associated with the early retirement of equipment were identified so no mitigation measures are required.

Solid/Hazardous Waste Impacts Associated with Long-Term Strategies

PROJECT-SPECIFIC IMPACT: Additional control measures and solid/hazardous waste impacts associated with the long-term strategy or long-term measures may also be expected. The long-term control measures are expected to include aggressive development and commercialization of advanced mobile source control technologies. Examples of the potential control options for mobile sources under the long-term strategy that could result in solid/hazardous waste impacts include: (1) accelerated retirement of older vehicles; (2) retrofit of existing vehicles such as passenger cars and light- and medium-duty trucks with advanced emission controls (e.g., OEM catalytic converters, oxygen sensors); (3) retrofitting heavy-duty diesel trucks and buses with NOx reducing catalysts; (4) repowering construction and industrial equipment with cleaner diesel engines or alternative fuels potential; and (5) replacing two-stroke lawn and garden equipment and recreational boats with four-stroke or electric alternatives (where feasible).

Federal sources such as planes, trains, ships, 49-state vehicles, and farm and construction equipment less than 175 horsepower representing about 34 percent of the NOx emissions in 2010 will also be required to achieve significant reductions under the long-term control strategy. The emission reductions from these sources will be based on more stringent emission standards for new engines as well retrofit controls (e.g., NOx catalyst, SCR, alternative fuels) for existing engines.

Implementation of the long-term control measures would be expected to result in additional solid/hazardous waste impacts. The specific details of the long-term control measures have not yet been developed and will need to be developed as part of the rulemaking process. Therefore, the impacts related to the long-term control measures are discussed qualitatively since detailed information for a quantitative analysis is not available. The potential solid/hazardous waste impacts from the long-term measures for each of the resources discussed in this subchapter are evaluated below.

- Spent Batteries: The analysis for the short-term control measures indicate that the solid/hazardous waste impacts associated with spent batteries were potentially significant. Mitigation measures were developed that are expected to minimize any increase in illegal disposal of batteries by requiring the exchange of old batteries for new batteries and reducing the potential for increased illegal disposal to less than significant. Implementation of the long-term control measures is expected to result in an increase in the use of electric vehicles and increased generation of batteries. The additional need for batteries associated with the long-term control measures are expected to be less than significant, since the mitigation measures would also apply to the long-term control measures and require the exchange of old batteries for new batteries.

- Solid Waste Impacts due to Air Pollution Control Technologies: No significant solid/hazardous waste impacts were identified for solid waste impacts due to short-term air pollution control technologies as part of the 2003 AQMP. Implementation of the long-term control measures is expected to result in an increase in the use of air pollution control equipment that could result in an increase in the amount of solid/hazardous waste generated over that evaluated for the short-term control measures. Substantial quantities of solid/hazardous waste are not expected to be generated from air pollution control equipment and the increase is waste is expected to be within the capacity of existing disposal facilities. Therefore, no significant impacts on solid/hazardous waste are expected due to air pollution equipment.

- Carbon Adsorption: The analysis for the short-term control measures indicate that the solid/hazardous waste impacts associated with the use of carbon adsorption were less than significant, after mitigation. Spent carbon is usually recycled and reused rather than disposed in landfills. Implementation of the long-term control measures may result in an increase in the use of carbon absorption, however, recycling and reusing activated carbon is expected to minimize the amount of spent carbon transferred to landfill. Therefore, the overall impacts of the long-term control measures on solid/hazardous waste from carbon adsorption are expected to be less than significant.

- Particulate Traps/Prefilters/Filters/HEPA Filters: The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter from the short-term control measures are expected to be small as the amount of material collected is small. Therefore, the potential impacts of the use of additional filtration equipment on solid/hazardous waste generation are less than significant. Implementation of the long-term control measures would likely increase the use of filtration equipment and generate an incremental increase in waste generated. The increase in the amount of material collected is expected to remain small so that no significant impacts are expected.

- Catalytic Oxidation: The impacts associated with catalytic oxidization due to implementation of the short-term control measures were not expected to be significant. Due to the recycling of catalysts used in catalytic oxidation, no significant impacts on waste disposal are expected. Implementation of the long-term control measures would likely increase the use of catalytic oxidation and generate an incremental increase in waste generated. Due to the recycling of catalysts used in catalytic oxidation, no significant impacts on waste disposal are expected.

- Early Retirement of Equipment: Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Therefore, no significant solid/hazardous waste impacts were identified due to implementation of the short-term control measures. Like the short-term control measures, implementation of the long-term control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted so that no significant solid/hazardous waste impacts would be required.

PROJECT-SPECIFIC MITIGATION: No additional significant impacts on solid/hazardous waste associated with the long-term control measures were identified so no additional mitigation measures are required.

4.5.5 CUMULATIVE SOLID/HAZARDOUS WASTE IMPACTS

The proposed 2003 AQMP is not expected to result in significant, cumulative adverse impacts on solid or hazardous waste. Potentially significant impacts were identified for the increase in waste from electric batteries and carbon from control equipment. Recycling of materials from both of these waste streams is common. Further, mitigation measures were identified that would minimize the potential for adverse impacts.

Recycling of catalytic oxidation catalysts is also common for their precious metal content so no significant impacts on solid/hazardous waste are expected from this waste stream.

The control measures are expected to allow a number of different control methods to comply with required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Further, recycling and reuse of vehicles and vehicle parts is common and expected to continue. Therefore, the increase in solid waste is expected to be within the permit capacity so that no significant cumulative impacts would be expected.

CUMULATIVE SOLID/HAZARDOUS WASTE MITIGATION: No significant cumulative solid/hazardous waste impacts were identified so no mitigation measures are proposed.

4.5.6 SUMMARY OF SOLID/HAZARDOUS WASTE IMPACTS

The following is the summary of the conclusions of the analysis of solid/hazardous impacts associated with implementation of the 2003 AQMP.

- Spent Batteries: The analysis indicates that the solid/hazardous waste impacts associated with spent batteries were potentially significant. Mitigation measures were developed that are expected to minimize any increase in illegal disposal of batteries by requiring the exchange of old batteries for new batteries and reducing the potential for increased illegal disposal to less than significant.

- Solid Waste Impacts due to Air Pollution Control Technologies: No significant solid/hazardous waste impacts were identified for solid waste impacts due to short-term air pollution control technologies as part of the 2003 AQMP.

- Carbon Adsorption: The solid/hazardous waste impacts associated with the use of carbon adsorption are considered less than significant, after mitigation. Spent carbon is usually recycled and reused rather than disposed in landfills. Therefore, the overall impacts on solid/hazardous waste from carbon adsorption are expected to be less than significant.

- Particulate Traps/Prefilters/Filters/HEPA Filters: The increase in the amount of waste generated from the use of filters and the collection of additional particulate matter from the control measures are expected to be small as the amount of material collected is small.

- Catalytic Oxidation: The impacts associated with catalytic oxidization due to implementation of the control measures were not expected to be significant. Due to the recycling of catalysts used in catalytic oxidation, no significant impacts on waste disposal are expected.

- Early Retirement of Equipment: Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Therefore, no significant solid/hazardous waste impacts were identified due to implementation of the control measures.

- Hazards Associated with Long-Term Control Strategies: Additional solid/hazard waste impacts are possible due to implementation of the long-term control measures (over and above those discussed in other portions of the EIR). The increase in waste generated is expected to be controlled with the mitigation measures above. No additional significant waste impacts (over and above those discussed above) are expected.

- Cumulative Solid/Hazardous Waste Impacts: The control measures are expected to allow a number of different control methods to comply with required emission reductions. The most cost effective control measures would be expected to be implemented. Control measures that would require new equipment will generally require that it occur as the life of the old equipment is exhausted and new equipment is put into service. Further, recycling and reuse of vehicles and vehicle parts is common and expected to continue. Therefore, the increase in solid waste is expected to be within the permit capacity so that no significant cumulative impacts would be expected.