CONSTRUCTION PERMIT APPLICATION

INDIANA RECYCLING AND RENEWABLE FUELS, LLC.
DBA ILLINOIS RECYCLING AND RENEWABLE FUELS, LLC.
1301 SOUTH STATE STREET
CHICAGO HEIGHTS, ILLINOIS

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1.0 INTRODUCTION

Indiana Recycling and Renewable Fuels, LLC dba Illinois Recycling and Renewable Fuels, LLC (IRRF) is submitting this application to the Illinois Environmental Protection Agency for a permit to construct and operate a recycling plant in Chicago Heights, Illinois. The proposed project will be located in an area zoned M3 for heavy industrial manufacturing at 1301 South State Street in Chicago Heights (See Figure 1). The proposed IRRF facility has received local siting approval from the City of Chicago Heights (See Appendix A.)

The site will be served by a long dedicated access road (entrance off 1301 State Street) and is part of a new industrial park near the center of a large industrial (≈1,000 acres) area on the eastern limits of Chicago Heights.

More than half of the industrial zoned land in the approximately 1,000 acre area including land east and west of the project site is currently unutilized and has either been set aside as improved land ready for manufacturing use, or was formerly farm land (i.e. land east of the plant beyond the Commonwealth Edison transmission right of way) which is now being marketed for improvement and industrial use.

The project site is a parcel of land in the Thorn Creek Conservancy Industrial Park developed to support the concept of green product manufacturing in harmony with wetlands and improved regional drainage. The industrial park has been developed under scrutiny of the U. S. Army Corps of Engineers and with the support of hydrological engineers of the Land Resource Management Group (LRMG) to include a dedicated wetlands area to coexist with heavy industrial manufacturing. Approximately half of the industrial park has been set aside for wetlands, wildlife, and nature trails with the balance, including the new service road, project site, and several other land tracts, filled and compacted with construction fill to bring all usable manufacturing land to well above the 100-year flood plain.

The proposed project site comprises approximately 27 acres, located approximately 0.3 miles north of Lincoln Highway (Rt. 30), 0.6 miles south of Joe Orr Road, one quarter of a mile east of State Street, and 0.4 miles west of Cottage Grove. It is bounded on the east by the Commonwealth Edison transmission right of way. The approximate center of the plant is located at 41º30′41.64″N/87º36′.46″W (See Figure 1). The area surrounding the proposed site is composed of predominantly industrial facilities. For example, land south of the proposed project site is used for junk auto storage and salvage. Land north of the site is largely used for trucking operation. Property to the north and south of the site on the west side of State Street is comprised of an approximately mile-long row of heavy manufacturing plants. A large Ford plant is located southeast of the plant near the intersection of Cottage Grove and Route 30.

The proposed IRRF facility will mechanically sort and separate iron and steel ferrous metals, and aluminum, copper, brass, stainless, and zinc, non-ferrous metals, bulky paper, bulky plastics, bulky textiles and bulky metals for recycling. A high biomass content mixed material including non-recyclable waste paper, corrugated, cardboard, food scraps and yard waste, and plastics still remaining in the MSW after community recycling will be mechanically separated from sand, dirt, glass, ceramics, metals and other non-organic material and used to produce refuse derived fuel (RDF).

The composition of Municipal Solid Waste (MSW) received by the plant has been assumed to be consistent with the average composition of municipal waste in the United States, as published by the Environmental Protection Agency for year 2005. This waste has the following composition:

	2005 Data	
	'000 tpy	**Wt. %**
Organic		
Newspaper	12,050	4.95%
Cardboard	30,930	12.59%
Misc. Paper	40,970	16.68%
Plastic	28,910	11.77%
Rubber	6,700	2.73%
Textile	11,140	4.53%
Food Waste	29,230	11.90%
Yard Waste	32,070	13.05%
Wood	18,500	7.53%
Subtotal:	210,500	85.69%
Inorganic		
Iron	13,770	5.61%
Aluminum	3,210	1.31%
Metals	1,740	0.71%
Glass	12,750	5.19%
Other	3,690	1.50%
Subtotal:	35,160	14.31%
Total:	**245,660**	**100.00%**
% Ash		19.72%
% Moisture		24.71%
HHV, Btu/lb.		5,555

“The Executive Summary of the 2005 Facts and Figures Municipal Solid Waste in the United States” is included as Appendix B.

2.0 PROCESS DESCRIPTION

The proposed IRRF Chicago Heights RDF plant is designed to receive and further recycle most of the municipal solid waste left over after community recycling programs within the project service area. Many community recycling programs in the United States have been in operation for 15-20 years or more and many are currently operated in locations with renewable fuel projects.

Community recycling programs in the Chicago Region are comparable to most regions of the nation but still leave about 20,000 tons per day (tons/day) of MSW in the Greater Chicago Region requiring disposal. Most of this waste is hauled to landfills approximately 70 miles away in the adjoining states of Indiana and Michigan, and to facilities in Southern Illinois.

The IRRF facility will reduce the quantity of MSW requiring transfer and long distance truck haul from the region to remote landfills while helping to maximize recycling within the region. It is a facility that can be built quickly (about 12 month's construction schedule) and more than 80% of the incoming MSW will be recycled in primary and secondary raw materials markets.

The IRRF facility will have a significant economic impact on the area economy by building a plant that will create 75 to 100 permanent basic industrial jobs and an estimated 300 additional jobs for local equipment suppliers, contractors, and service industry and over 150 construction jobs during the construction period.

The IRRF facility is located near the middle of an industrial area, Zoned M3

The planned IRRF facility will be a 200,000 square foot manufacturing plant with six main rooms: 1) an enclosed MSW truck receiving and turning room, 2) an enclosed MSW storage and out feed room, 3) an enclosed bag open flail and magnetic separator room with a common wall separating the two (2) MSW process infeed lines, Line 100 and Line 200, 4) an enclosed municipal solid waste mechanical processing room, 5) an enclosed storage room for temporary stockpile of RDF and compacting, for use as a high quality refuse derived fuel, and 6) an enclosed room for major maintenance, repair and rebuilding and storage of equipment. The site will have additional rooms for warehousing and parts storage.

The IRRF facility general arrangement is shown in Figure 2 and includes a 3,000-gallon diesel fuel storage tank. A spill containment plan will be provided. Diesel tanks are exempt for purposes of air regulations in accordance with 35 IAC Subtitle B, Section 201.146 (n)(3).

The tank is provided to refuel onsite operating **mobile** equipment and will be refilled approximately once per week. The expected annual diesel fuel use is approximately 170,000 gallons per year.

The volatile organic material (VOM) emissions from the diesel storage tank are estimated to be less than 0.44 tons per year (tons/yr).

3.0 DISCUSSION OF RECYCLING FACILITY EMISSIONS SOURCES

3.1 ROOM 1: TRUCK RECEIVING & TURNING

This room with traffic flow east to west will be an enclosed truck receiving and turning area. Delivery vehicles enter the room on the east side, then turn and back through roll up doors into Room 2. They exit through the same doors and will exit the building on the west side. From four to six MSW collection vehicles including both route type and transfer trailers will be in this room concurrently. The room will be 115′ W x 275′ L x 55′ High with a room air volume of 1,740,000 cubic feet. **Air negative draft flow from the room will be 50,000 cubic feet per minute (cfm)**. Air will be drawn by negative draft into the room through either the truck ingress and egress doors or inlet vents in the building walls. Air will be discharged from the room through five roof ventilators designated as provided in Table 1.

These ventilators will discharge directly to the atmosphere. Each roof ventilator will be accessible for servicing from the roof of the building via a walkway at the roof level. The only emission will be the exhaust from mobile vehicles. This room provides a driveway passage for delivery vehicles; MSW unloading will be in Room 2. Good housekeeping and sweeping will be provided in this area and all truck driveways on site.

3.2 ROOM 2: MSW STOCKPILE AND STORAGE

A rubber tire wheel loader will push the unloaded municipal solid waste into stockpile with an average height of about 18′. A crawler tractor (bulldozer) will spread and compact the stockpile MSW.

MSW will be removed from storage by a wheel loader and pushed near infeed conveyors along the south wall of the MSW storage building.

The MSW storage room will be 185′ wide x 275′ long x 55′ high with a room air volume of 2,800,000 cubic feet. Air will be drawn by negative draft into the room through the truck ingress from Room 1 (the truck receiving/turning room) and inlet vents in the building walls. **The negative draft airflow from the room will be 100,000 cfm.** Air will be drawn from the room through ten roof ventilators designated as provided in Table 1.

Each roof ventilator will be accessible from the roof of the building via a walkway at roof level. Air from each ventilator will be ducted to one of two large central air ducts, which will carry the airflows to high efficiency bag filters, MSW Bag Filter 1 and Bag Filter 2 located along the north wall of the secondary raw material storage room. Very little particulate matter (PM) emissions are projected for this Room 2 for the following reasons:

1. Air velocities will be very low above 20 feet/minute (ft/min). For contrast, this is only 1% of the 2,000 ft/min airflow rate required to suspend and pneumatically convey shredded recycle paper to balers.
2. MSW is largely paper mixed with plastic with about 22% - 25% average moisture. Routine handling, including truck unloading, stockpile, and feed onto a conveyor, involves dropping only a short distance and does not generate much dust in the work area.
3. A high percentage of the waste is bagged.
4. Dusts and fugitive material associated with the MSW are of relatively large particle size and readily settle in the area where material is handled.
5. The MSW storage room is very large and acts like a settling chamber.
6. Based on the IRRF engineer's experience at numerous MSW processing plants in the USA and several European plants, the dust generated near the MSW receiving stockpile, storage and infeed conveyors is very low.
7. The MSW stockpile/storage room and truck receiving and turning rooms are ventilated to provide fresh air changes and maintain truck and wheel loader exhaust emissions to acceptable levels. Multiple ventilators are located at the roof level and generate very low room air velocities.

The projected particulate discharges from Room 2 (the MSW stockpile and storage room) shown in Table 1 are IRRF engineer estimates based on long term work at many MSW recycling/processing facilities.

3.3 ROOM 3A AND 3B: FLAIL BAG OPENER ROOMS

MSW removed from stockpile/storage will be conveyed from west to east along the south wall of the MSW storage room to the flail rooms in Building 3 on the east side of the plant. Building 3 will be divided by a wall, and two flail bag opener rooms (Room 3A and 3B) will be available at the facility.

These rooms will be enclosed in concrete bunkers approximately 50′ long x 30′ wide x 50′ high. The rooms will have a parabola shape tube type supports at the roofline over which an all-weather canvas enclosure is fastened, similar to many currently operating facilities. All equipment in the room will be totally enclosed

The flails will have revolving rotors with thin (1½" wide), widely-spaced hammers which break open bags to expose material for downstream processing. The flails do not have grates and much of the waste is not touched by the flail hammers.

The flails will act as bag breakers and will be totally enclosed from the enclosed infeed conveyor, through the shredder rooms and to a point about 25 ft past the shredder rooms.

Each flail room will have 10,000 cfm fugitive dust pick up hoods at the point of discharge from the flail discharge conveyor onto the next conveyor.

Since the equipment in these rooms will be totally enclosed during the operation, and will have separate dust collection systems as outlined below, the fugitive dust emissions from this flail room is expected to be low.

The projected fugitive dust discharge from the flail is shown in Table 1.

3.4 ROOM 4: MSW PROCESSING/RDF PREPARATION ROOM

The coarsely shredded MSW leaving Room 3, the flail room, will be conveyed past a magnetic separator into the main MSW process room where the waste stream will be further sorted to recover recycling materials, by a series of Trommel screens, air classifiers, and shredders.

The main process room production process will be a "closed" system whereby dust from MSW Trommeling, air classification and shredding operation will be contained by a system of aspirated enclosures connected to each piece of processing equipment. Air from these enclosures will be ducted through cyclones and bag filters for dust removal. The MSW process room airflows are summarized in Table 1.

Trommel Screens

Trommels are slow revolving rotary screens with multiple stages and are designed to remove material by size fraction.

Primary Trommels

There are three primary Trommels located in Room 4 designed to remove different size fractions.

The fractions removed can be directed to residue disposal or to further preparation to recover metals, remove inerts and produce a combustible fraction free of inerts.

Secondary Trommel Screens

The secondary Trommel screens are used in tandem with disc screens for RDF product size control to scalp and remove oversize material (which is conveyed back to MSW storage). There are two secondary Trommel screen/disc screen product size control units in Room 4.

Air Classifiers

Air classifiers are simple adjustable air columns through which air is drawn upward through the column to convey light solid material to cyclone separators.

The air classifiers have an infeed opening in the lower half of the air column that allows material to be air classified to be fed into the air classifier. The air classifier has an adjustable back wall in the infeed area designed to reduce the air velocity enough in this zone to allow heavy (air classifier heavies), dense non-combustible material i.e. rocks, metal, glass, ceramics, etc. remaining in the infeed material to drop out of the air stream and be removed and sent to landfill.

Primary Air Classifiers

The IRRF Chicago Heights facility will have three primary air classifiers in Room 4 after each Hammermill shredder operation. The material feed to these air classifiers will have very little loose inert glass, metal, etc. due to the steps taken to remove these materials ahead of the Hammermill shredders.

Secondary Air Classifier

The plant will have one secondary air classifier used to air classify the unders material from the primary Trommel screen second stage.

Shredding Operation

Flail

The IRRF process uses a flail bag opener (very course primary shredder) with widely spaced thin hammers and no grates to brake open bags and expose MSW for easy sorting. Two flails are used: one in Room 3A and one in Room 3B.

Hammermill Shredder

The IRRF process uses Hammermills to produce a shredded (sized/combustible fraction prior to the final air classification step. This size 1½ - 2″ combustible fraction is passed through air classifiers to remove residual metals, glass and dense materials as noted above, prior to passing through secondary Trommels/disc screens) and conveying to Room 5 for RDF storage. Three Hammermills are used along the south wall of Room 4.

The main MSW Process Room will be subjected to continuous negative draft of 127,500 cfm.

Air will be drawn by negative draft into the main Process Room 4 through building wall air vents and will serve as make up air for the Room 4 production process.

Good daily housekeeping will remove spillage and keep the room clean.

Negative draft air entering the room will be aspirated through production equipment as follows:

Primary Air Classifiers - Unit 1, 2 and 3

The primary air classifiers 1, 2 and 3 receive the shredded product stream from Shredders 1, 2 and 3.

Each shredder is under negative draft from the inlet of the shredder to the air classifier serving the shredder.

Secondary Air Classifier – Unit 4

Air is drawn directly from the room into the air classifier.

Primary and Secondary Trommels

Air is drawn though dust hoods at the Trommel inlets and discharge points.

Room 4 – Room Air

The bag filters serving these process areas are:

Point	Make Up Air cfm	Served by Bag Filter	Discharge To:
Primary air classifier/shredder Unit 1	30,000	BF 9	Room 5
Primary air classifier/shredder Unit 2	30,000	BF 10	Room 5
Primary air classifier/shredder Unit 3	30,000	BF 11	Room 5
Secondary air classifier	7,500	BF 5	Atmosphere
Primary and secondary Trommels	30,000	BF 6	Atmosphere

Each shredder will receive an average feed rate of 37.55 tons per hour (tons/hr) of the product stream from plant operations. Concentrations of mercury, cadmium, and lead will be very low and the annual release to the atmosphere will be insignificant (reference Appendix C).

The shredder is designed with a wind gate that draws air through the shredder from the point of feed. The discharge conveyor from the shredder will have 1½"– 2" nominal size and will be totally enclosed between the shredder and the air classifiers. The air classifier is a totally enclosed vertical air column common in industry and is designed to remove any dense residue material from the shredded product and pneumatically convey the shredder light fraction to cyclone separators.

The cyclone separator equipment will remove the shredder product with 95% efficiency in cyclone separator 1 and 90% efficiency in cyclone separator 2. The separated shredded product will be conveyed to RDF product storage.

A small percentage, 0.15 tons per hour of material from each shredder operation will pass to high efficiency reverse pulse jet bag filters designed to remove material with efficiency of 99%.

A 60,000 cfm induced draft fan located after the cyclone separators will draw air through the air classifier and cyclone separator. Half of this flow (30,000 cfm) will be returned to the air classifier with two entry points below the shredder infeed into the air classifier. The other 30,000 cfm will pass to a high efficiency bag filter. The classified enclosed feed area is under negative draft of 30,000 cfm.

Most of the PM is expected to be greater than 300 microns.

1.	Number of shredders	3 each
2.	Average Feed Rate to Each Shedder	37.55 tons/hr
3.	Product Flow From Shredder to Air Classifier	37.55 tons/hr
4.	Product Flow From Air Classifier to Cyclone Separator No. 1	37.55 tons/hr
5.	Product Flow From Cyclone Separator No. 1 to Cyclone Separator No. 2 37.55 tons/hr –x (1-95%)	1.88 tons/hr
6.	Product Flow From Cyclone Separator No. 2 to High Efficiency Bag Filter. 1.88 tons/hr x (1-90%)	0.188 tons/hr
7.	Emission From High Efficiency Bag Filter 0.188 tons/hr x (1- 99.5%)	0.00095 tons/hr
8.	Total Uncontrolled Particulate Emissions From Shredder/ air classifier operation 3 times 0.00095 tons/hr	0.0029 tons/hr

9. Criteria Metal Emissions *

   The process will remove a very high percentage of the materials that contain mercury, cadmium, and lead from the waste stream and send these materials to off-site recyclers or to a landfill as appropriate.

*Emission information from *"Sources and Fate of Lead, Cadmium, and Mercury in Resource Recovery Process"* included in Appendix C.

Table 3.4-1 Summary of IRRF MSW Process Room 4
Bag Filter-Controlled PM and Fugitive Dust Emission

Facility Location	Uncontrolled PM Emissions lb/hr	Emissions Control Equipment	Emissions Control Efficiency (%)	Expected Annual Controlled Particulate Emissions lb/hr
MSW BF 9	300	Bag Filter	99.5	1.50
MSW BF 10	300	Bag Filter	99.5	1.50
MSW BF 11	300	Bag Filter	99.5	1.50
Total:	**900**			**4.50**

Air Discharged to Room 5

3.5 ROOM 5: RDF STORAGE ROOM

The RDF will be pre-compacted and pushed into the temporary storage room by two stationary packers. The compacted material will enter the room at floor level and will be moved into stockpile by rubber tire wheel loaders. The RDF not fed onto conveyors will be stockpiled to approximately 18 feet high, then will be removed from storage and pushed onto steel apron conveyors by a wheel loader. Much of the RDF will be pushed directly onto the loadout conveyors as it is pushed into temporary storage by the compactors from Room 4. Four additional compactors will compress the RDF for final loadout. Overflow material will be placed into temporary stockpile by the wheel loader and later pushed onto the loadout conveyor for removal and hauled off. The apron conveyors will transfer the RDF to belt conveyors, which will transport it to the loadout area.

The RDF storage room will receive 90,000 cfm of filtered process air from this MSW process Room 4. Air will enter the room from near the roof. Air entering the RDF storage room will be dispensed as follows:

Three (3) 30,000 cfm air ducts (total 90,000 cfm) from the three shredder bag filters will discharge air at low velocity into the southeast side of the room through a common air plenum.

Air will be dispensed throughout the room. The RDF temporary storage room will be 200′ x 150′ x 55′ high with a room air volume of 1,650,000 cubic feet. Air velocities in this large high ceiling room will be low, only a few feet per minute.

Air will enter the room from the main MSW process Room 4 and from wall vents, and through access doors from the MSW Storage Room 2 to RDF Storage Room 4.

Room 5 will be served by ten each, 10,000 cfm roof mounted ventilators similar to Room 2. An enclosed collection system identical to Room 2 will collect fugitive dust from Room 5 and pass the air stream to one of two high efficiency bag filters. The two bag filters, BF-7 and BF-8, will be located adjacent to the bag filters serving Room 2. See Figure 2.

Each roof ventilator will be accessible from the roof of the building via a walkway at the roof level.

Compacted RDF will be transported and loaded into railcars via mobile equipment in the Load Area. The Load Area will be paved with concrete and covered with a roof.

This facility will be subject to 35 IAC 212.321(b), the Process Weight Rate Rule. Due to limitations in the facility's local siting approval, the amount of MSW that can be received daily is 2,704 tons. As shown on Table 3, this rule will limit annual emissions from this facility to 172.18 tons of PM. This rule establishes the potential to emit (PTE) for PM. Because the relationship of PM to PM_{10} is not known, we have assumed PM_{10}=PM. Therefore, the annual PM_{10} PTE is above the major source threshold for PM_{10}. IRRF hereby requests that this facility be limited by a Federally Enforceable State Operating Permit (FESOP) and that the daily MSW be limited to 2,704 tons and that PM_{10} emissions be limited to 18.3 tons annually based on the continued use of the eight bag filters as control devices.

The facility is hereby requesting an allowable throughput of 2,704 tons per day of MSW and a PM/PM-10 emission rate of 18.30 tons per year and 1.83 tons per month. Based on the facility-wide MSW throughput and PM/PM-10 emission rate an emission factor of 0.037 lb per ton of MSW throughput has been calculated based on the following:

	Material Throughput		*Emission Factor***	*Emissions*	
Pollutant	***(ton MSW/mth)***	***(ton MSW/yr)***	***(lb/ton)***	***(ton/mth)***	***(ton/yr)***
PM/PM-10	98,969	986,960	0.037*	1.83	18.30

**(18.30 [ton/yr PM/PM-10] * 2,000 [lb/ton]) / (2,704 [ton/day MSW] x 365 [days/yr]) =*
0.037 lb PM/PM-10/ton MSW processed

****The emission factor reflects the fact that the baghouse fans will operate continuously.*

This facility will not be subject to any United States Environmental Protection Agency (USEPA) New Source Performance Standards (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP) requirements as mandated by 40 CFR Part 60 and 40 CFR Part 63 respectively.

This facility will be subject to the fugitive dust requirements contained in Section 212.301. The Standard Industrial Classification (SIC) Code for IRRF is 4953. In accordance with Section 212.302, Section 212.304 through 212.310 and 212.312 will not apply to this source because 4953 is not one of the SIC Codes listed in 212.302. Also, the facility is not located in the geographical areas defined in 212.324. Even though the facility is not subject to 212.304 through 212.310 and 212.312, there will be a fugitive dust plan in place, and it is described in greater detail later in this narrative. All storage piles will be enclosed and all roadways will be paved. All particulate control equipment shall limit emissions not to exceed 0.03 grains per dry standard cubic foot (gr/dscf).

Calculated Vehicle Emissions Based on AP-42

Item	**Source and Location**
1.0	Project site at 1301 State Street – vehicles traffic patterns and number of vehicles

1.1 MSW delivery truck traffic 150 vehicles/day average

Normal scale house:
Hrs. 7 am. - 5 pm.
Est.: 80% of loads

After hours delivery by special arrangement:
From 5:30 am - 9:00 pm.
Est.: 20% of loads

Estimated 40 transfer trailer loads at 80,000 lbs. gross (MSW/day) and 110 packer truck loads at 60,000 lbs. gross weight, (MSW/day) average

The projected fugitive roadway dust particulate matter (PM) emissions from mobile equipment are included in Table 4.

3.6 COMPONENTS OF FUGITIVE EMISSIONS CONTROL PLAN

In an effort to reduce the generation and emissions of fugitive emissions at the IRRF facility, the following management initiatives will be implemented:

- All roadways, service drives, load areas, and truck storage areas will be paved with concrete and swept by road sweeper.
- A well-managed, daily housekeeping program is important to the successful operation of the Facility and is essential for vector control. The working surroundings and orderliness of the plant will have a large impact on personnel morale and discipline.
- The process equipment, mobile equipment, floors, walls and ledges in the process area will be cleaned daily.
- Floor areas in the process building and all the equipment aisles and maintenance areas will be swept daily by mobile equipment or by hand (in tight areas).
- Aisles or quarters used frequently by personnel will be swept daily and will be washed, as needed, to maintain a clean working environment.
- Waste will be delivered and removed from the site in enclosed vehicles. All unloading of Acceptable Waste and out loading of residues will be conducted indoors.
- Equipment will be emptied when not in operation. All process residues will be out loaded as they are produced onto enclosed vehicles for transport to an offsite sanitary landfill.
- Residues will be hauled to disposal points as they are produced and will normally be stored only for a short period, as needed, to facilitate load out and haul to disposal points. Recycled materials such as metals and recyclable paper, plastic and textiles will also normally be kept on-site only for short periods while scrap trailers are being loaded. Solid waste stored at the end of the working day will be stored indoors with suitable controls to guard against safety and environmental hazards.
- RDF will be loaded and shipped off-site daily.
- The Facility will employ technical and management procedures to ensure continued compliance with all applicable operating conditions and housekeeping. This will be important to ensure acceptable litter and odor control conditions. The intent of this program is to ensure the proper implementation, completion and accountability of

all programs as they relate to the facility. The main emphasis is on employee awareness to prevent rather than control pollution (fugitive dust, odor, litter, etc.) through training and participation.

- A task force comprised of management and hourly personnel will work to find ways to continually improve employee education and participation in emissions control programs. The facility recognizes the importance of training its employees in all aspects of the facility's requirements to meet its regulations.

To facilitate the necessary cleaning procedures to ensure an effective litter and dust control program, the Facility will schedule a street sweeper to clean the roadway surfaces three (3) days a week. This is in addition to the cleaning crew(s) who sweep and contain litter on a daily basis. This Plan coupled with the Storm Water Pollution Prevention Plan (SWPPP), which addresses good housekeeping practices, together with concise work practice descriptions, ensures effective litter control. In addition, the following activities are defined as standard operating procedures.

- Effectively managing a "closed door policy" to ensure dust containment.
- Making sure delivery trucks are enclosed and do not remove any covers until they have reached the MSW tipping floor.
- Inspection and maintenance of all equipment in accordance with manufacturer recommendations.
- Daily sweeping and cleaning of the tipping floor, RDF and residue loading areas, and bottom and bag house catch loading areas.
- Daily janitorial cleaning of the administrative office, sanitary and employee facilities (i.e. washrooms, locker rooms, etc.), and control room.
- Daily sweeping, both mechanical and manual, of the RDF production area.
- Daily inspection and cleanup of plant grounds from spillage, litter, and other foreign material.
- Weekly inspection and cleaning of drainage basins, oil-water separators, sumps, etc.
- Seasonal plant cleaning of walls and other areas in MSW storage, processing and RDF storage areas.
- Weekly fire and safety inspections.

The facility will employ a contractor whose sole function will be to provide housekeeping support. Each day the facility area managers will meet with the contractor to identify those areas requiring special attention for that given day. In addition, the contractor will have standing orders to target specific areas each day. The contractor will be personally administered by the Plant Manager who has overall responsibility for the status and presentation of the facility. In an effort to audit the work being performed, the Shift Supervisor and/or Environmental Coordinator will conduct a daily walk-down of the plant site to ensure that all critical areas will be properly maintained.

3.7 COMPONENTS OF ODOR EMISSIONS CONTROL PLAN

Odors from the Process Facility will be controlled by equipment design, good housekeeping practices and proper material management. Acceptable Waste and recycled products will be stored under roof, out of direct sunlight, compacted in storage and processed as soon as possible and removed from the site as soon as possible on a "first-in", "first-out" basis. Process residues and recycled materials will be loaded into transfer vehicles with covers and hauled from the site as they are filled.

Facility Operating Plans and Equipment design factors for odor control include:

- Proper conveyor design to assure material containment thereby minimizing spillage.
- Use of solid structure support members, where practical, with emphasis on minimizing ledges that may collect material or dust.
- Walkways constructed of solid plating rather than open grating.
- Grouting around equipment footings and supports to facilitate cleaning.
- Providing facility design features for easy access to areas for cleaning and maintenance, and,
- Use of atomized deodorizing sprays in key areas as practiced in large transfer station operations on the west coast and in many areas of the country and most large MSW recycling and processing facilities.
- Areas will include:
  - Atomize deodorant into air stream at inlets of bag filters MSWBF-1, MSWBF-2.
  - Other location as needed; BF-6, BF-7 and into the shredder bag filter operation BF 9, BF 10, BF 11.

This facility has received local siting approval from the City of Chicago Heights. This documentation is included in Appendix A.

Appendix D contains a list of government offices contacted as part of IRRF's siting and outreach efforts.

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION

FOR AGENCY USE ONLY

ID NUMBER:	
PERMIT #:	
COMPLETE ☐ INCOMPLETE ☐	DATE COMPLETE:
CHECK #:	ACCOUNT NAME:

THIS FORM IS TO BE USED BY ALL SOURCES TO SUPPLY FEE INFORMATION THAT MUST ACCOMPANY ALL CONSTRUCTION PERMIT APPLICATIONS. ***THIS APPLICATION MUST INCLUDE PAYMENT IN FULL TO BE DEEMED COMPLETE***. MAKE CHECK OR MONEY ORDER PAYABLE TO THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY. SEND TO THE ADDRESS ABOVE. DO NOT SEND CASH. REFER TO INSTRUCTIONS (197-INST) FOR ASSISTANCE.

SOURCE INFORMATION

1) SOURCE NAME: Indiana Recycling and Renewable Fuels, LLC d/b/a: Illinois Recycling and Renewable Fuels, LLC

2) PROJECT NAME: Chicago Heights Facility

3) SOURCE ID NO. (IF APPLICABLE): 031045AOG

4) CONTACT NAME: Mr. M. L. Smith, P.E.

5) CONTACT PHONE NUMBER: 708-745-1185

FEE DETERMINATION

6) FILL IN THE FOLLOWING THREE BOXES AS DETERMINED IN SECTIONS 1 THROUGH 4 BELOW:

$ 5,000 + $ 20,000 = $ 25,000

SECTION 1 SUBTOTAL		SECTION 2, 3 OR 4 SUBTOTAL		GRAND TOTAL
$ 5,000	+	$ 20,000	=	$ 25,000

SECTION 1: STATUS OF SOURCE / PURPOSE OF SUBMITTAL

7) YOUR APPLICATION WILL FALL UNDER ONLY ONE OF THE FOLLOWING SIX CATEGORIES DESCRIBED BELOW. CHECK THE BOX THAT APPLIES, ENTER THE CORRESPONDING FEE IN THE BOX TO THE RIGHT AND COPY THIS FEE INTO THE SECTION 1 SUBTOTAL BOX ABOVE. PROCEED TO APPLICABLE SECTIONS.

FOR PURPOSES OF THIS FORM:

- ***MAJOR SOURCE*** IS A SOURCE THAT IS REQUIRED TO OBTAIN A CAAPP PERMIT.
- ***SYNTHETIC MINOR* SOURCE** IS A SOURCE THAT HAS TAKEN LIMITS ON POTENTIAL TO EMIT IN A PERMIT TO AVOID CAAPP PERMIT REQUIREMENTS (E.G., FESOP).
- ***NON-MAJOR* SOURCE** IS A SOURCE THAT IS NOT A MAJOR OR SYNTHETIC MINOR SOURCE.

☐ EXISTING SOURCE WITHOUT STATUS CHANGE OR WITH STATUS CHANGE FROM SYNTHETIC MINOR TO MAJOR SOURCE OR VICE VERSA. ENTER $0 AND PROCEED TO SECTION 2.

☐ EXISTING NON-MAJOR SOURCE THAT WILL BECOME SYNTHETIC MINOR OR MAJOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.

☐ EXISTING MAJOR OR SYNTHETIC MINOR SOURCE THAT WILL BECOME NON-MAJOR SOURCE. ENTER $4,000 AND PROCEED TO SECTION 3.

☒ NEW MAJOR OR SYNTHETIC MINOR SOURCE. ENTER $5,000 AND PROCEED TO SECTION 4.

☐ NEW NON-MAJOR SOURCE. ENTER $500 AND PROCEED TO SECTION 3.

☐ AGENCY ERROR. IF THIS IS A TIMELY REQUEST TO CORRECT AN ISSUED PERMIT THAT INVOLVES ONLY AN AGENCY ERROR AND IF THE REQUEST IS RECEIVED WITHIN THE DEADLINE FOR A PERMIT APPEAL TO THE POLLUTION CONTROL BOARD, THEN ENTER $0. SKIP SECTIONS 2, 3 AND 4. PROCEED DIRECTLY TO SECTION 5.

$ 5,000
SECTION 1 SUBTOTAL

SECTION 2: SPECIAL CASE FILING FEE

8) FILING FEE. IF THE APPLICATION ONLY ADDRESSES ONE OR MORE OF THE FOLLOWING, CHECK THE APPROPRIATE BOXES, ENTER $500 IN THE SECOND BOX UNDER FEE DETERMINATION ABOVE, SKIP SECTIONS 3 AND 4 AND PROCEED DIRECTLY TO SECTION 5. OTHERWISE, PROCEED TO SECTION 3 OR 4, AS APPROPRIATE.

☐ ADDITION OR REPLACEMENT OF CONTROL DEVICES ON PERMITTED UNITS
☐ PILOT PROJECTS/TRIAL BURNS BY A PERMITTED UNIT
☐ APPLICATIONS ONLY INVOLVING INSIGNIFICANT ACTIVITIES UNDER 35 IAC 201.210 (MAJOR SOURCES ONLY)
☐ LAND REMEDIATION PROJECTS
☐ REVISIONS RELATED TO METHODOLOGY OR TIMING FOR EMISSION TESTING
☐ MINOR ADMINISTRATIVE-TYPE CHANGE TO A PERMIT

THIS AGENCY IS AUTHORIZED TO REQUIRE AND YOU MUST DISCLOSE THIS INFORMATION UNDER 415 ILCS 5/39. FAILURE TO DO SO COULD RESULT IN THE APPLICATION BEING DENIED AND PENALTIES UNDER 415 ILCS 5 ET SEQ. IT IS NOT NECESSARY TO USE THIS FORM IN PROVIDING THIS INFORMATION. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

SECTION 3: FEES FOR CURRENT OR PROJECTED NON-MAJOR SOURCES

9) IF THIS APPLICATION CONSISTS OF A SINGLE NEW EMISSION UNIT <u>OR</u> NO MORE THAN TWO MODIFIED EMISSION UNITS, ENTER $500.	9)
10) IF THIS APPLICATION CONSISTS OF MORE THAN ONE NEW EMISSION UNIT <u>OR</u> MORE THAN TWO MODIFIED UNITS, ENTER $1,000.	10)
11) IF THIS APPLICATION CONSISTS OF A NEW SOURCE OR EMISSION UNIT SUBJECT TO SECTION 39.2 OF THE ACT (I.E., LOCAL SITING REVIEW); A COMMERCIAL INCINERATOR OR A MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR AN EMISSION UNIT DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $15,000.	11)
12) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.	12)
13) SECTION 3 SUBTOTAL (ADD LINES 9 THROUGH 12) TO BE ENTERED ON PAGE 1.	13)

SECTION 4: FEES FOR CURRENT OR PROJECTED MAJOR OR SYNTHETIC MINOR SOURCES

Application Contains Modified Emission Units Only	14) FOR THE FIRST MODIFIED EMISSION UNIT, ENTER $2,000.	14)	
	15) NUMBER OF ADDITIONAL MODIFIED EMISSION UNITS = ______ X $1,000.	15)	
	16) LINE 14 PLUS LINE 15, OR $5,000, WHICHEVER IS LESS.		16)
Application Contains New And/Or Modified Emission Units	17) FOR THE FIRST NEW EMISSION UNIT, ENTER $4,000.	17) $4,000	
	18) NUMBER OF ADDITIONAL NEW AND/OR MODIFIED EMISSION UNITS = 7 X $1,000.	18) $7,000	
	19) LINE 17 PLUS LINE 18, OR $10,000, WHICHEVER IS LESS.		19) $10,000
Application Contains Netting Exercise	20) NUMBER OF INDIVIDUAL POLLUTANTS THAT RELY ON A NETTING EXERCISE OR CONTEMPORANEOUS EMISSIONS DECREASE TO AVOID APPLICATION OF PSD OR NONATTAINMENT NSR = ______ X $3,000.		20)
Additional Supplemental Fees	21) IF THE NEW SOURCE OR EMISSION UNIT IS SUBJECT TO SECTION 39.2 OF THE ACT (I.E., SITING); A COMMERCIAL INCINERATOR OR OTHER MUNICIPAL WASTE, HAZARDOUS WASTE, OR WASTE TIRE INCINERATOR; A COMMERCIAL POWER GENERATOR; OR ONE OR MORE OTHER EMISSION UNITS DESIGNATED AS A COMPLEX SOURCE BY AGENCY RULEMAKING, ENTER $25,000.		21)
	22) IF THE SOURCE IS A NEW MAJOR SOURCE SUBJECT TO PSD, ENTER $12,000.		22)
	23) IF THE PROJECT IS A MAJOR MODIFICATION SUBJECT TO PSD, ENTER $6,000.		23)
	24) IF THIS IS A NEW MAJOR SOURCE SUBJECT TO NONATTAINMENT (NAA) NSR, ENTER $20,000.		24)
	25) IF THIS IS A MAJOR MODIFICATION SUBJECT TO NAA NSR, ENTER $12,000.		25)
	26) IF APPLICATION INVOLVES A DETERMINATION OF CLEAN UNIT STATUS AND THEREFORE IS NOT SUBJECT TO BACT OR LAER, ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. ______ X $5,000.		26)
	27) IF APPLICATION INVOLVES A DETERMINATION OF MACT FOR A POLLUTANT AND THE PROJECT IS NOT SUBJECT TO BACT OR LAER FOR THE RELATED POLLUTANT UNDER PSD OR NSR (E.G., VOM FOR ORGANIC HAP), ENTER $5,000 PER UNIT FOR WHICH A DETERMINATION IS REQUESTED OR OTHERWISE REQUIRED. _____ X $5,000.		27)
	28) IF A PUBLIC HEARING IS HELD (SEE INSTRUCTIONS), ENTER $10,000.		28) $10,000
29) SECTION 4 SUBTOTAL (ADD LINES 16 AND LINES 19 THROUGH 28) TO BE ENTERED ON PAGE 1.			29) $20,000

SECTION 5: CERTIFICATION

NOTE: APPLICATIONS WITHOUT A SIGNED CERTIFICATION WILL BE DEEMED INCOMPLETE.

30) I CERTIFY UNDER PENALTY OF LAW THAT, BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE INFORMATION CONTAINED IN THIS FEE APPLICATION FORM IS TRUE, ACCURATE AND COMPLETE.

BY: M L Smith
SIGNATURE

V.P., Manager of Engineering
TITLE OF SIGNATORY

M.L. Smith, P.E.
TYPED OR PRINTED NAME OF SIGNATORY

APRIL / 4, / 2011
DATE

APPLICATION PAGE 21

Printed on Recycled Paper
197-FEE

Illinois Environmental Protection Agency
Division Of Air Pollution Control -- Permit Section
P.O. Box 19506
Springfield, Illinois 62794-9506

Construction Permit Application For a FESOP Source (FORM APC628)

For Illinois EPA use only
BOA ID No.:
Application No.:
Date Received:

This form is to be used to supply information to obtain a construction permit for a proposed project involving a Federally Enforceable State Operating Permit (FESOP) or Synthetic Minor source, including construction of a new FESOP source. Other necessary information must accompany this form as discussed in the "General Instructions For Permit Applications," Form APC-201.

Proposed Project

1. Working Name of Proposed Project:
Chicago Heights Facility

2. Is the project occurring at a source that already has a permit from the Bureau of Air (BOA)?
☒ No ☐ Yes If Yes, provide BOA ID Number: __ __ __ __ __ __ __ __ __

3. Does this application request a revision to an existing construction permit issued by the BOA?
☒ No ☐ Yes If Yes, provide Permit Number: __ __ __ __ __ __ __ __

4. Does this application request that the new/modified emission units be incorporated into an existing FESOP issued by the BOA?
☒ No ☐ Yes If Yes, provide Permit Number: __ __ __ __ __ __ __ __

Source Information

5. Source name:*
Indiana Recycling and Renewable Fuels, LLC d/b/a: Illinois Recycling and Renewable Fuels, LLC

6. Source street address:*
1301 South State Street

7. City: Chicago Heights	8. County: Cook	9. Zip code: 60411

ONLY COMPLETE THE FOLLOWING FOR A SOURCE WITHOUT AN ID NUMBER.

10. Is the source located within city limits? ☐ Yes ☐ No
If no, provide Township Name:

11. Description of source and product(s) produced:	12. Primary Classification Code of source: SIC: __ __ __ __ or NAICS: __ __ __ __ __ __
13. Latitude (DD:MM:SS.SSSS):	14. Longitude (DD:MM:SS.SSSS):

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Applicant Information

15. Who is the applicant? ☒ Owner ☐ Operator	16. All correspondence to: (check one) ☒ Owner ☐ Operator ☐ Source
17. Applicant's FEIN: 26-2627247	18. Attention name and/or title for written correspondence: Mr. M. L. Smith, P.E.

This Agency is authorized to require and you must disclose this information under 415 ILCS 5/39. Failure to do so could result in the application being denied and penalties under 415 ILCS 5 et seq. It is not necessary to use this form in providing this information. This form has been approved by the forms management center.

Owner Information*

19. Name:
Illinois Recycling and Renewable Fuels, LLC

20. Address:
21686 East Lincoln Highway

21. City: Lynwood	22. State: Illinois	23. Zip code: 60411

* If this information different than previous information, then complete Form 272-CAAPP for a Request for Ownership Change for CAAPP Permit for an initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Operator Information (If Different from Owner)*

24. Name
Same As Owner

25. Address:

26. City:	27. State:	28. Zip code:

* If this information different than previous information, then complete a new Form 200-CAAPP to change the source name in initial FESOP application for the source or Form APC-620 for Air Permit Name and/or Ownership Change if the FESOP has been previously issued.

Technical Contacts for Application

29. Preferred technical contact: (check one) ☒ Applicant's contact ☐ Consultant

30. Applicant's technical contact person for application:
Mr. M. L. Smith, P.E.

31. Contact person's telephone number 708-745-1185	32. Contact person's email address: mlsmith_pe@sbcglobal.net

33. Applicant's consultant for application:
Conestoga-Rovers & Associates - Don Sutton

34. Consultant's telephone number: 217-717-9009	35. Consultant's email address: dsutton@craworld.com

Review Of Contents of the Application

36. Is the emission unit covered by this application already constructed? If "yes", provide the date construction was completed: Note: The Illinois EPA is unable to issue a construction permit for a emission unit that has already been constructed.	☐ Yes	☒ No
37. Does the application include a narrative description of the proposed project?	☒ Yes	☐ No
38. Does the application contain a list or summary that clearly identifies the emission units and air pollution control equipment that are part of the project?	☒ Yes	☐ No
39. Does the application include process flow diagram(s) for the project showing new and modified emission units and control equipment and related existing equipment and their relationships?	☒ Yes	☐ No
40. If the project is at a source that has not previously received a permit from the BOA, does the application include a source description, plot plan and site map?	☒ Yes	☐ No

Review Of Contents of the Application (continued)

41. Does the application include relevant information for the proposed project as requested on Illinois EPA, BOA application forms (or otherwise contain all the relevant information)?	☒ Yes ☐ No
42. Does the application identify and address all applicable or potentially applicable emissions standards, including: a. State emission standards (35 IAC Chapter I, Subtitle B); b. Federal New Source Performance Standards (40 CFR Part 60); c. Federal standards for HAPs (40 CFR Parts 61 and 63)?	☒ Yes ☐ No
43. Does the application address whether the proposed project or the source could be a major project for Prevention of Significant Deterioration (PSD), 40 CFR 52.21?	☐ Yes ☐ No . ☒ N/A
44. Does the application address for which pollutant(s) the proposed project or the source could be a major project for PSD, 40 CFR 52.21?	☐ Yes ☐ No . ☒ N/A
45. Does the application address whether the proposed project or the source could be a major project for "Nonattainment New Source Review," (NA NSR), 35 IAC Part 203?	☐ Yes ☐ No ☒ N/A
46. Does the application address for which pollutant(s) the proposed project or the source could be a major project for NA NSR, 35 IAC Part 203?	☐ Yes ☐ No ☒ N/A
47. Does the application address whether the proposed project or the source could potentially be subject to federal Maximum Achievable Control Technology (MACT) standard under 40 CFR Part 63 for Hazardous Air Pollutants (HAP) and identify the standard that could be applicable?	☒ Yes ☐ No ☐ N/A* * Source not major ☐ Project not major ☐
48. Does the application identify the HAP(s) from the proposed project or the source that would trigger the applicability of a MACT standard under 40 CFR Part 63?	☐ Yes ☐ No ☒ N/A
49. Does the application include a summary of the current and the future potential emissions of the source after the proposed project has been completed for each criteria air pollutant and/or HAP (tons/year)?	☐ Yes ☐ No ☒ N/A* * Applicability of PSD, NA NSR or 40 CFR 63 not applicable to the source's emissions.
50. Does the application include a summary of the requested permitted annual emissions of the proposed project for the new and modified emission units (tons/year)?	☐ Yes ☐ No ☒ N/A* * Project does not involve an increase in emissions from new or modified emission units.
51. Does the application include a summary of the requested permitted production, throughput, fuel, or raw material usage limits that correspond to the annual emissions limits of the proposed project for the new and modified emission units?	☐ Yes ☐ No ☒ N/A* * Project does not involve an increase in emissions from new or modified emission units.
52. Does the application include sample calculations or methodology for the emission estimations and the requested emission limits?	☒ Yes ☐ No
53. Does the application address the relationships with and implications of the proposed project for the source's FESOP?	☐ Yes ☐ No ☒ N/A* *FESOP not yet issued.
54. If the application contains information that is considered a TRADE SECRET, has such information been properly marked and claimed and other requirements to perfect such a claim been satisfied in accordance with 35 IAC Part 130? Note: "Claimed information will not be legally protected from disclosure to the public if it is not properly claimed or does not qualify as trade secret information.	☐ Yes ☐ No ☒ N/A* * No information in the application is claimed to be a TRADE SECRET

Review Of Contents of the Application (continued)	
55. If the source is located in a county other than Cook County, are two separate copies of this application being submitted?	☐ Yes ☐ No
56. If the source is located in Cook County, are three separate copies of this application being submitted?	☒ Yes ☐ No
57. Does the application include a completed "FEE DETERMINATION FOR CONSTRUCTION PERMIT APPLICATION," Form 197-FEE, for the emission units and control equipment for which a permit for construction or modification is being sought?	☒ Yes ☐ No
58. Does the application include a check in the proper amount for payment of the Construction permit fee?	☒ Yes ☐ No

Note: Answering "No" to Items 36 through 58 may result in the application being deemed incomplete.

Signature Block

Pursuant to 35 IAC 201.159, all applications and supplements thereto shall be signed by the owner and operator of the source, or their authorized agent, and shall be accompanied by evidence of authority to sign the application. Applications without a signed certification will be deemed incomplete.

59. Authorized Signature:

I certify under penalty of law that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete and that I am a responsible official for the source, as defined by Section 39.5(1) of the Environmental Protection Act. In addition, the technical contact person identified above is authorized to submit (by hard copy and/or by electronic copy) any supplemental information related to this application that may be requested by the Illinois EPA.

BY: M L Smith — V.P., Manager of Engineering

AUTHORIZED SIGNATURE — TITLE OF SIGNATORY

M.L. Smith, P.E. — APRIL 4, 2011

TYPED OR PRINTED NAME OF SIGNATORY — DATE

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE

Revision #: ________________
Date: _____ / _____ / _____
Page _________ of ________
Source Designation:
____

AIR POLLUTION CONTROL EQUIPMENT DATA AND INFORMATION

FOR AGENCY USE ONLY

ID NUMBER:

CONTROL EQUIPMENT #:

DATE:

THIS FORM MUST BE COMPLETED FOR EACH AIR POLLUTION CONTROL EQUIPMENT. COMPLETE AND PROVIDE THIS FORM IN ADDITION TO THE APPLICABLE ADDENDUM FORM 260-A THROUGH 260-K. A SEPARATE FORM MUST BE COMPLETED FOR EACH MODE OF OPERATION OF AIR POLLUTION CONTROL EQUIPMENT FOR WHICH A PERMIT IS BEING SOUGHT.

SOURCE INFORMATION

1) SOURCE NAME:
Indiana Recycling and Renewable Fuels, LLC d/b/a: Illinois Recycling and Renewable Fuels, LLC

2) DATE FORM PREPARED: April 2011	3) SOURCE ID NO. (IF KNOWN): 031045AOG

GENERAL INFORMATION

4) NAME OF AIR POLLUTION CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:
See Table 2.

5) FLOW DIAGRAM DESIGNATION OF CONTROL EQUIPMENT AND/OR CONTROL SYSTEM:

6) MANUFACTURER OF CONTROL EQUIPMENT (IF KNOWN):

7) MODEL NUMBER (IF KNOWN):	8) SERIAL NUMBER (IF KNOWN):
9) DATES OF COMMENCING CONSTRUCTION, OPERATION AND/OR MOST RECENT MODIFICATION OF THIS EQUIPMENT (ACTUAL OR PLANNED)	a) CONSTRUCTION (MONTH/YEAR):
	b) OPERATION (MONTH/YEAR):
	c) LATEST MODIFICATION (MONTH/YEAR):

10) BRIEFLY DESCRIBE MODIFICATION (IF APPLICABLE):

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE
073932-01-260-CAAPP

11) LIST ALL EMISSION UNITS AND OTHER CONTROL EQUIPMENT DUCTING EMISSIONS TO THIS CONTROL EQUIPMENT:

NAME	DESIGNATION OR CODE NUMBER
See Table 1	

12) DOES THE CONTROL EQUIPMENT HAVE MORE THAN ONE MODE OF OPERATION? ☐ YES ☒ NO

IF YES, EXPLAIN AND IDENTIFY WHICH MODE IS COVERED BY THIS FORM (NOTE: A SEPARATE AIR POLLUTION CONTROL EQUIPMENT FORM 260-CAAPP MUST BE COMPLETED FOR EACH MODE):

13) IDENTIFY ALL ATTACHMENTS TO THIS FORM RELATED TO THIS AIR POLLUTION CONTROL EQUIPMENT(E.G., TECHNICAL DRAWINGS):

Figures 3 and 4.

OPERATING SCHEDULE

14) IDENTIFY ANY PERIOD WHEN THE CONTROL EQUIPMENT WILL NOT BE OPERATING DUE TO SCHEDULED MAINTENANCE AND/OR REPAIRS WHEN THE FEEDING EMISSION UNIT(S) TO THIS CONTROL EQUIPMENT IS/ARE IN OPERATION:

Control equipment will be in operation at all times while the emission units are in operation.

15a) IDENTIFY ANY PERIODS DURING OPERATION OF THE FEEDING EMISSION UNIT(S) WHEN THE CONTROL EQUIPMENT IS/ARE NOT USED:

Control equipment will be in operation at all times while the emission units are in operation.

b) IS THIS CONTROL EQUIPMENT IN OPERATION AT ALL OTHER TIMES THAT THE FEEDING EMISSION UNIT(S) IS/ARE IN OPERATION? ☒ YES ☐ NO

IF NO, EXPLAIN AND PROVIDE THE DURATION OF THE CONTROL EQUIPMENT DOWNTIME:

See Introduction, Section 1.0.

APPLICABLE RULES

16) PROVIDE ANY SPECIFIC EMISSION STANDARD(S) AND LIMITATION(S) SET BY RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT (E.G., VOM, IAC 218.207(b)(1), 81% OVERALL & 90% CONTROL DEVICE EFF.):

REGULATED AIR POLLUTANT(S)	EMISSION STANDARD(S)	REQUIREMENT(S)

17) PROVIDE ANY SPECIFIC RECORDKEEPING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	RECORDKEEPING RULE(S)	REQUIREMENT(S)

18) PROVIDE ANY SPECIFIC REPORTING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	REPORTING RULE(S)	REQUIREMENT(S)

19) PROVIDE ANY SPECIFIC MONITORING RULE(S) WHICH ARE APPLICABLE TO THIS EMISSION UNIT:

REGULATED AIR POLLUTANT(S)	MONITORING RULE(S)	REQUIREMENT(S)

20) PROVIDE ANY SPECIFIC TESTING RULES AND/OR PROCEDURES WHICH ARE APPLICABLE TO THIS EMISSION UNIT :

REGULATED AIR POLLUTANT(S)	TESTING RULE(S)	REQUIREMENT(S)

COMPLIANCE INFORMATION

21) IS THE CONTROL SYSTEM IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS? ☒ YES ☐ NO

IF NO, THEN FORM 294-CAAPP "COMPLIANCE PLAN/SCHEDULE OF COMPLIANCE -- ADDENDUM FOR NON COMPLYING EMISSION UNITS" MUST BE COMPLETED AND SUBMITTED WITH THIS APPLICATION.

22) EXPLANATION OF HOW INITIAL COMPLIANCE IS TO BE, OR WAS PREVIOUSLY, DEMONSTRATED:

See Introduction, Section 1.0.

23) EXPLANATION OF HOW ONGOING COMPLIANCE WILL BE DEMONSTRATED:

See Introduction, Section 1.0.

TESTING, MONITORING, RECORDKEEPING AND REPORTING

24a) LIST THE PARAMETERS THAT RELATE TO AIR EMISSIONS FOR WHICH RECORDS ARE BEING MAINTAINED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE UNIT OF MEASUREMENT, THE METHOD OF MEASUREMENT, AND THE FREQUENCY OF SUCH RECORDS (E.G., HOURLY, DAILY, WEEKLY):

PARAMETER	UNIT OF MEASUREMENT	METHOD OF MEASUREMENT	FREQUENCY

APPLICATION PAGE 29

24b) BRIEFLY DESCRIBE THE METHOD BY WHICH RECORDS WILL BE CREATED AND MAINTAINED. FOR EACH RECORDED PARAMETER INCLUDE THE METHOD OF RECORDKEEPING, TITLE OF PERSON RESPONSIBLE FOR RECORDKEEPING, AND TITLE OF PERSON TO CONTACT FOR REVIEW OF RECORDS:

PARAMETER	METHOD OF RECORDKEEPING	TITLE OF PERSON RESPONSIBLE	TITLE OF CONTACT PERSON

c) IS COMPLIANCE OF THE CONTROL EQUIPMENT READILY DEMONSTRATED BY REVIEW OF THE RECORDS? ☐ YES ☒ NO

IF NO, EXPLAIN:

Facility has not been constructed yet.

d) ARE ALL RECORDS READILY AVAILABLE FOR INSPECTION, COPYING AND/OR SUBMITTAL TO THE AGENCY UPON REQUEST? ☐ YES ☒ NO

IF NO, EXPLAIN:

Facility has not been constructed yet.

25a) DESCRIBE ANY MONITORS OR MONITORING ACTIVITIES USED TO DETERMINE FEES, RULE APPLICABILITY OR COMPLIANCE:

N/A

b) WHAT OPERATING PARAMETER(S) IS(ARE) BEING MONITORED (E.G., COMBUSTION CHAMBER TEMPERATURE)?

N/A

c) DESCRIBE THE LOCATION OF EACH MONITOR (E.G., EXIT OF COMBUSTION CHAMBER):

N/A

25d) IS EACH MONITOR EQUIPPED WITH A RECORDING DEVICE? ☐ YES ☐ NO

IF NO, LIST ALL MONITORS WITHOUT A RECORDING DEVICE:

N/A

e) IS EACH MONITOR REVIEWED FOR ACCURACY ON AT LEAST A QUARTERLY BASIS? ☐ YES ☐ NO

IF NO, EXPLAIN:

N/A

f) IS EACH MONITOR OPERATED AT ALL TIMES THE CONTROL EQUIPMENT IS IN OPERATION? ☐ YES ☐ NO

IF NO, EXPLAIN:

N/A

26) PROVIDE INFORMATION ON THE MOST RECENT TESTS, IF ANY, IN WHICH THE RESULTS ARE USED FOR PURPOSES OF THE DETERMINATION OF FEES, RULE APPLICABILITY OR COMPLIANCE. INCLUDE THE TEST DATE, TEST METHOD USED, TESTING COMPANY, OPERATING CONDITIONS EXISTING DURING THE TEST AND A SUMMARY OF RESULTS. IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-1:

TEST DATE	TEST METHOD	TESTING COMPANY	OPERATING CONDITIONS	SUMMARY OF RESULTS

27) DESCRIBE ALL REPORTING REQUIREMENTS AND PROVIDE THE TITLE AND FREQUENCY OF REPORT SUBMITTALS TO THE AGENCY:

REPORTING REQUIREMENTS	TITLE OF REPORT	FREQUENCY
Emissions	Annual Emissions Report	Annually

CAPTURE AND CONTROL

28) DESCRIBE THE CAPTURE SYSTEM USED TO CONTAIN, COLLECT AND TRANSPORT EMISSIONS TO THE CONTROL EQUIPMENT. INCLUDE ALL HOODS, DUCTS, FANS, ETC. ALSO INCLUDE THE METHOD OF CAPTURE USED AT EACH EMISSION POINT. (IF ADDITIONAL SPACE IS NEEDED, ATTACH AND LABEL AS EXHIBIT 260-2):

See Process Description, Section 2.0.

29) ARE FEATURES OF THE CAPTURE SYSTEM ACCURATELY DEPICTED IN THE FLOW DIAGRAM CONTAINED IN THIS APPLICATION? ☒ YES ☐ NO

IF NO, A SKETCH SHOWING THE FEATURES OF THE CAPTURE SYSTEM SHOULD BE ATTACHED AND LABELED AS EXHIBIT 260-3:

30) PROVIDE THE ACTUAL (MINIMUM AND TYPICAL) CAPTURE SYSTEM EFFICIENCY, CONTROL EQUIPMENT DESTRUCTION/REMOVAL EFFICIENCY, AND THE OVERALL REDUCTION EFFICIENCY PROVIDED BY THE COMBINATION OF THE CAPTURE SYSTEM AND CONTROL EQUIPMENT FOR EACH REGULATED AIR POLLUTANT TO BE CONTROLLED. ATTACH THE CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH THESE EFFICIENCIES WERE BASED AND LABEL AS EXHIBIT 260-4:

a) CONTROL PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)		CONTROL EQUIPMENT EFFICIENCY (%)		OVERALL REDUCTION EFFICIENCY (%)	
		(MIN)	(TYP)	(MIN)	(TYP)	(MIN)	(TYP)
i	See Table 1.						
ii							
iii							

iv. EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

b) METHOD USED TO DETERMINE EACH OF THE ABOVE EFFICIENCIES (E.G., STACK TEST, MATERIAL BALANCE, MANUFACTURER'S GUARANTEE, ETC.) AND THE DATE LAST TESTED, IF APPLICABLE:

	EFFICIENCY DETERMINATION METHOD	DATE LAST TESTED
CAPTURE:	Manufacturer's Guarantee	
CONTROL:	Manufacturer's Guarantee	
OVERALL:	Manufacturer's Guarantee	

c) REQUIRED PERFORMANCE:

	REGULATED AIR POLLUTANT	CAPTURE SYSTEM EFFICIENCY (%)	CONTROL EQUIPMENT EFFICIENCY (%)	OVERALL REDUCTION EFFICIENCY (%)	APPLICABLE RULE
i					
ii					
iii					

iv EXPLAIN ANY OTHER REQUIRED LIMITS ON CONTROL EQUIPMENT PERFORMANCE SUCH AS OUTLET CONCENTRATION, COOLANT TEMPERATURE, ETC.:

See Table 1.

(31)EMISSION INFORMATION											
REGULATED AIR POLLUTANT		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE EMISSION RATE			[2]PERMITTED EMISSION RATE	
		LBS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[3]OTHER TERMS	[4]DM	[5]RATE (UNITS)	APPLICABLE RULES	TONS PER YEAR (TONS/YR)	RATE (UNITS)	TONS PER YEAR (TONS/YR)
CARBON MONOXIDE (CO)	MAXIMUM:						( )				
	TYPICAL:						( )				
LEAD	MAXIMUM:						( )				
	TYPICAL:						( )				
NITROGEN OXIDES (NOx)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER (PART)	MAXIMUM:						( )				
	TYPICAL:						( )				
PARTICULATE MATTER <= 10 MICROMETERS (PM10)	MAXIMUM:						( )				
	TYPICAL:						( )				
SULFUR DIOXIDE (SO2)	MAXIMUM:						( )				
	TYPICAL:						( )				
VOLATILE ORGANIC MATERIAL (VOM)	MAXIMUM:						( )				
	TYPICAL:						( )				
OTHER, SPECIFY: ____________	MAXIMUM:						( )				
	TYPICAL:						( )				
EXAMPLE: PARTICULATE MATTER	MAXIMUM:	*5.00*	*21.9*	*0.3 GR/DSCF*		*1*	*6.0 (LBS/HR)*	*212.321*	*26.28*	*5.5 LBS/HR*	*22*
	TYPICAL:	*4.00*	*14.4*	*0.24 GR/DSCF*		*4*	*5.5 (LBS/HR)*	*212.321*	*19.80*		

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-5.

[1] PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2] PROVIDE THE EMISSION RATE THAT WILL BE USED AS A PERMIT SPECIAL CONDITION. THIS LIMIT WILL BE USED TO DETERMINE THE PERMIT FEE.
[3] PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G. PPM, GR/DSCF, ETC.)
[4] DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS), 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS)
[5] RATE - ALLOWABLE EMISSION RATE SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

(32) HAZARDOUS AIR POLLUTANT EMISSION INFORMATION

HAP INFORMATION		[1]ACTUAL EMISSION RATE					ALLOWABLE BY RULE	
NAME OF HAP EMITTED	[2]CAS NUMBER		POUNDS PER HOUR (LBS/HR)	TONS PER YEAR (TONS/YR)	[3]OTHER TERMS	[4]DM	[5]RATE OR STANDARD	APPLICABLE RULE
N/A		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
		MAXIMUM:						
		TYPICAL:						
EXAMPLE:		MAXIMUM:	*10.0*	*1.2*		*2*	*98% by wt control device*	*CFR 61*
Benzene	*71432*	TYPICAL:	*8.0*	*0.8*		*2*	*leak-tight trucks*	*61.302(b),(d)*

IMPORTANT: ATTACH CALCULATIONS, TO THE EXTENT THEY ARE AIR EMISSIONS RELATED, ON WHICH EMISSIONS WERE DETERMINED AND LABEL AS EXHIBIT 260-6.

[1] PROVIDE CONTROLLED EMISSIONS (E.G., THE EMISSIONS THAT WOULD RESULT AFTER ALL CONTROL AND CAPTURE EFFICIENCIES ARE ACCOUNTED FOR).
[2] CAS - CHEMICAL ABSTRACT SERVICE NUMBER.
[3] PLEASE PROVIDE ANY OTHER EMISSION RATE WHICH IS COMMONLY USED, REQUIRED BY A SPECIFIC LIMITATION OR THAT WAS MEASURED (E.G., PPM, GR/DSCF, ETC.).
[4] DM - DETERMINATION METHOD: 1) STACK TEST, 2) MATERIAL BALANCE, 3) STANDARD EMISSION FACTOR (AP-42 OR AIRS, 4) ENGINEERING ESTIMATE, 5) SPECIAL EMISSION FACTOR (NOT AP-42 OR AIRS).
[5] RATE - ALLOWABLE EMISSION RATE OR STANDARD SPECIFIED BY MOST STRINGENT APPLICABLE RULE.

See Tables 1 and 2 for all questions on this page.

EXHAUST POINT INFORMATION

33) DESCRIPTION OF EXHAUST POINT (STACK, VENT, ROOF MONITOR, INDOORS, ETC.). IF THE EXHAUST POINT DISCHARGES INDOORS, DO NOT COMPLETE THE REMAINING ITEMS.

34) DISTANCE TO NEAREST PLANT BOUNDARY FROM EXHAUST POINT DISCHARGE (FT):

35) DISCHARGE HEIGHT ABOVE GRADE (FT):

36) GOOD ENGINEERING PRACTICE (GEP) HEIGHT, IF KNOWN (FT):

37) DIAMETER OF EXHAUST POINT (FT): NOTE: FOR A NON CIRCULAR EXHAUST POINT, THE DIAMETER IS 1.128 TIMES THE SQUARE ROOT OF THE AREA.

38) EXIT GAS FLOW RATE	a) MAXIMUM (ACFM):	b) TYPICAL (ACFM):
39) EXIT GAS TEMPERATURE	a) MAXIMUM (°F):	b) TYPICAL (°F):

40) DIRECTION OF EXHAUST (VERTICAL, LATERAL, DOWNWARD):
Vertical

41) LIST ALL EMISSION UNITS AND CONTROL DEVICES SERVED BY THIS EXHAUST POINT:

NAME	FLOW DIAGRAM DESIGNATION
a)	
b)	
c)	
d)	
e)	
f)	
g)	

42) WHAT PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS ARE BEING DUCTED TO THIS EXHAUST POINT (%)?
100%

43) IF THE PERCENTAGE OF THE CONTROL EQUIPMENT EMISSIONS BEING DUCTED TO THE EXHAUST POINT IS NOT 100%, THEN EXPLAIN WHERE THE REMAINING EMISSIONS ARE BEING EXHAUSTED TO:

THE FOLLOWING INFORMATION NEED ONLY BE SUPPLIED IF READILY AVAILABLE.

44a) LATITUDE:	b) LONGITUDE:	
45) UTM ZONE:	b) UTM VERTICAL (KM):	c) UTM HORIZONTAL (KM):

APPLICATION PAGE 35

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL -- PERMIT SECTION
P.O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

FOR APPLICANT'S USE

Revision #: ________________

Date: _____ / _____ / _____

Page _________ of ________

Source Designation: ________________

SUPPLEMENTAL FORM AIR POLLUTION CONTROL EQUIPMENT FILTER (260C)

FOR AGENCY USE ONLY

ID NUMBER:

CONTROL EQUIPMENT #:

DATE:

DATA AND INFORMATION

1) FLOW DIAGRAM DESIGNATION OF FILTER:

See Table 1.

2) FILTER CONFIGURATION (CHECK ONE):

☐ OPEN PRESSURE ☐ CLOSED PRESSURE ☐ CLOSED SUCTION
☐ OTHER, SPECIFY: ____________________

3) DESCRIBE FILTER MATERIAL:

See Table 2.

4) FILTERING AREA (SQUARE FEET): See Table 2.

5) AIR TO CLOTH RATIO (FEET/MIN): See Table 2.

6) CLEANING METHOD

☐ SHAKER ☐ REVERSE AIR ☐ PULSE AIR ☐ PULSE JET
☐ OTHER, SPECIFY: ____________________

7) NORMAL RANGE OF PRESSURE DROP: 2 TO 4 (INCH H_20)

8a) INLET EMISSION STREAM PARAMETERS:

	MAX	TYPICAL
MOISTURE CONTENT (% BY VOLUME):		
PARTICULATE INLET LOADING (GRAINS/SCF):	See Table 1.	See Table 1.

b) MEAN PARTICLE DIAMETER (MICRONS):

THIS AGENCY IS AUTHORIZED TO REQUIRE THIS INFORMATION UNDER ILLINOIS REVISED STATUTES, 1991, AS AMENDED 1992, CHAPTER 111 1/2, PAR. 1039.5. DISCLOSURE OF THIS INFORMATION IS REQUIRED UNDER THAT SECTION. FAILURE TO DO SO MAY PREVENT THIS FORM FROM BEING PROCESSED AND COULD RESULT IN THE APPLICATION BEING DENIED. THIS FORM HAS BEEN APPROVED BY THE FORMS MANAGEMENT CENTER.

FOR APPLICANT'S USE

073932-01-260C-CAAPP

9) FILTER OPERATING PARAMETERS:

	DURING MAXIMUM OPERATION OF FEEDING UNIT(S)	DURING TYPICAL OPERATION OF FEEDING UNIT(S)
INLET FLOW RATE (SCFM):	See Table 1.	See Table 1.
INLET GAS TEMPERATURE (DEGREES FAHRENHEIT):	See Table 2.	See Table 2.
EFFICIENCY (PM REDUCTION):	(%) See Table 1.	(%) See Table 1.
EFFICIENCY (PM10 REDUCTION):	(%) See Table 1.	(%) See Table 1.

10) HOW IS FILTER MONITORED FOR INDICATIONS OF DETERIORATION (E.G., BROKEN BAGS)?

☐ CONTINUOUS OPACITY ☒ PRESSURE DROP ☐ ALARMS-AUDIBLE TO PROCESS OPERATOR

☐ VISUAL OPACITY READINGS, FREQUENCY: ____________________

☐ OTHER, SPECIFY: ____________________

11) DESCRIBE ANY RECORDING DEVICE AND FREQUENCY OF LOG ENTRIES:
N/A

12) DESCRIBE ANY FILTER SEEDING BEING PERFORMED:
N/A

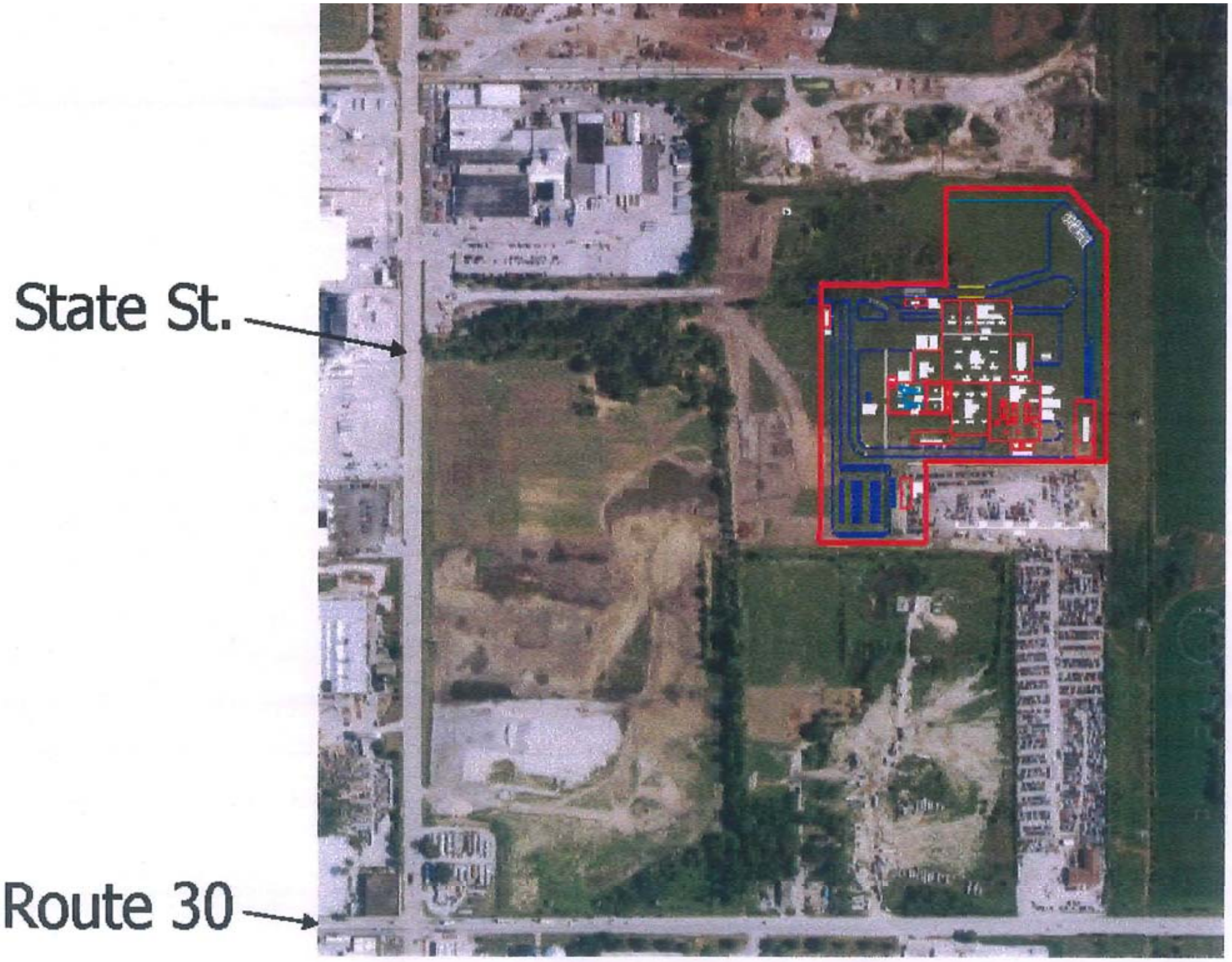
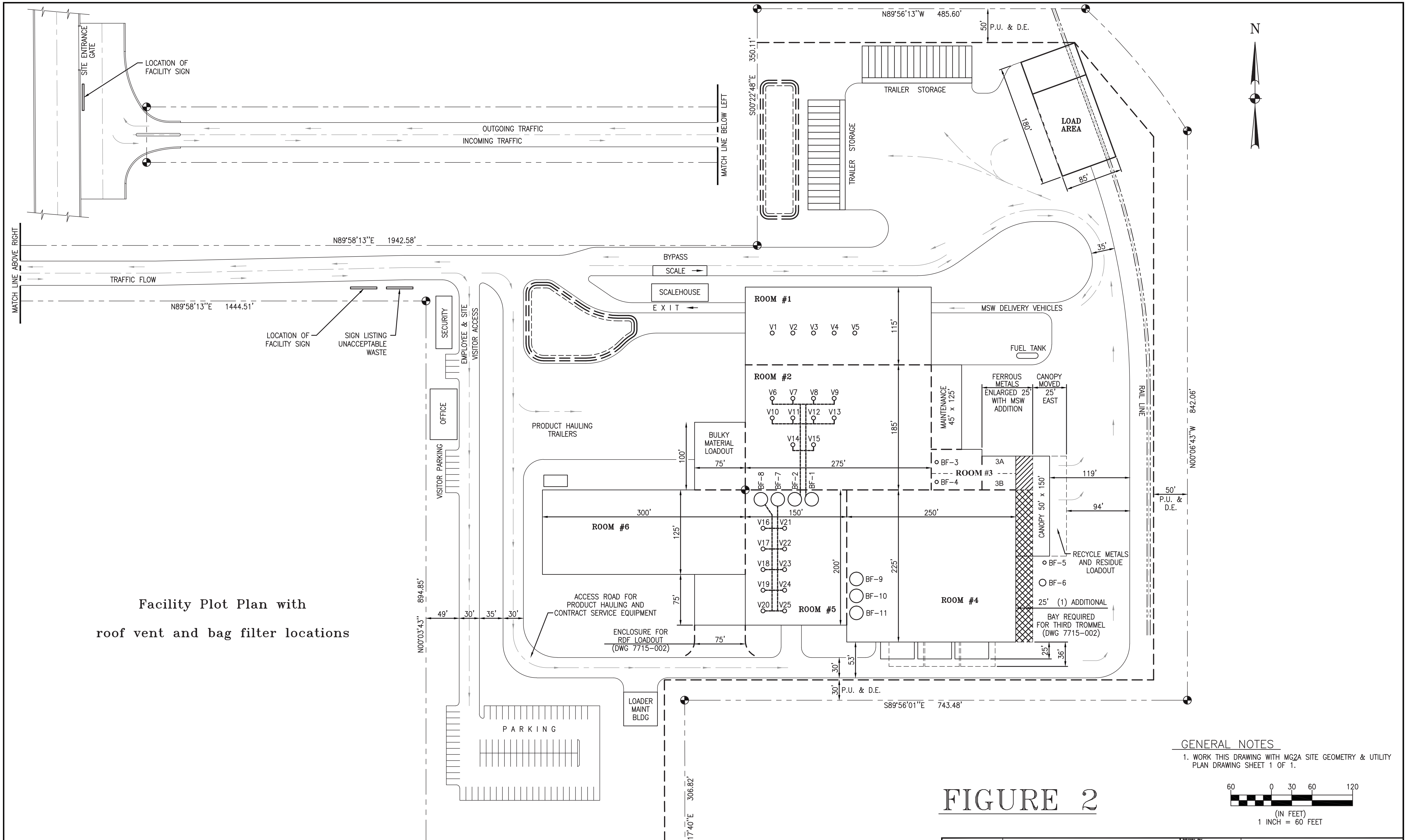


figure 1

SITE LOCATION MAP
CONSTRUCTION PERMIT APPLICATION
IRRF – Chicago Heights Facility



Facility Plot Plan with

roof vent and bag filter locations

FIGURE 2

GENERAL NOTES

1. WORK THIS DRAWING WITH MG2A SITE GEOMETRY & UTILITY PLAN DRAWING SHEET 1 OF 1.

60 0 30 60 120

(IN FEET)
1 INCH = 60 FEET

SUPERIOR ENGINEERING, LLC
Hammond, IN

PROJECT	SHEET	W.O.	VERSION	PLOT DATE
780038	7715–001		2004	6/23/2010

REVISIONS		
NO	DATE	BY
1		
2		
3		
4		
5		

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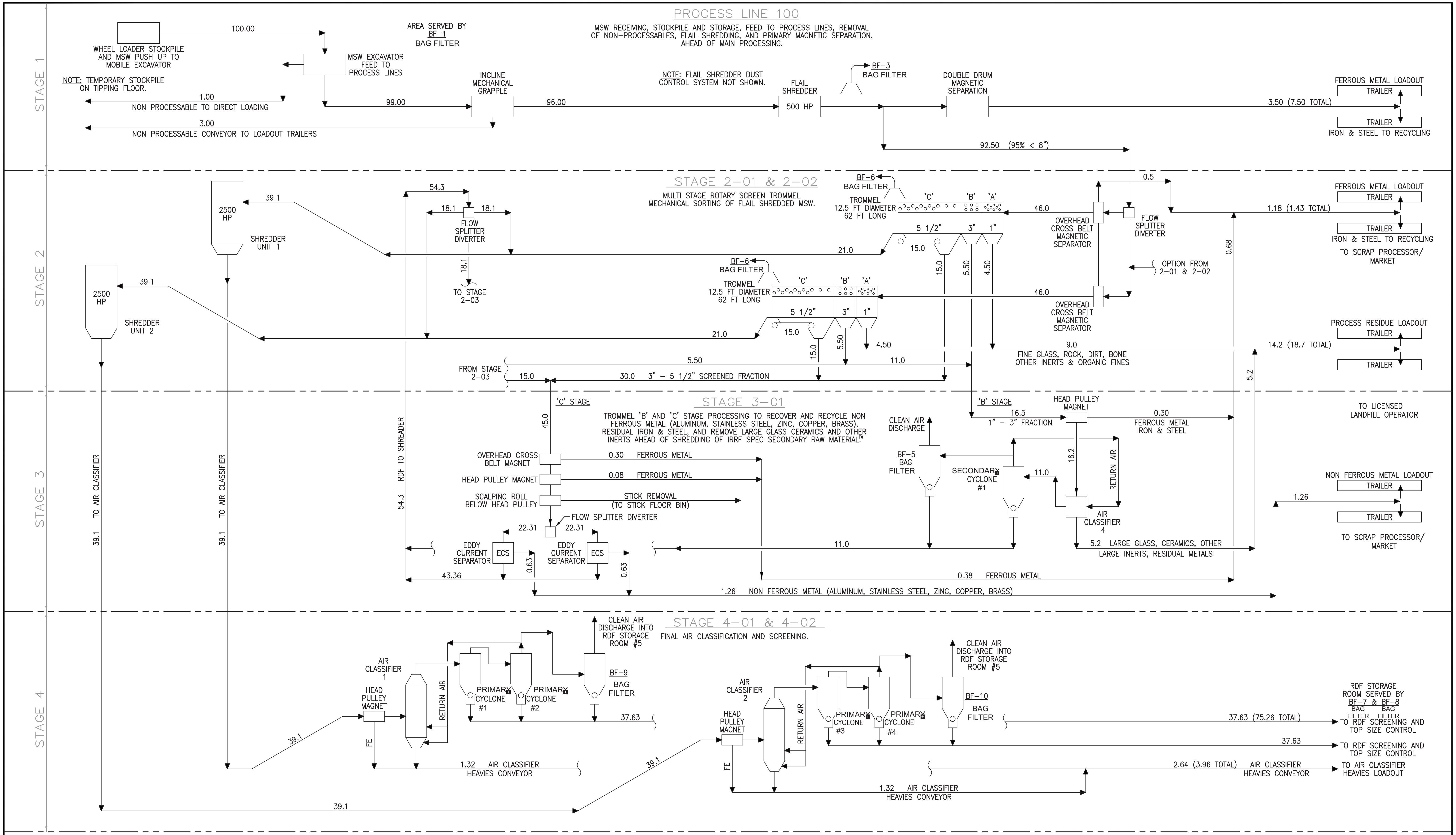
PROJECT NAME ILLINOIS RECYCLING AND RENEWABLE FUELS (IRRF) CHICAGO HEIGHTS RECYCLING PLANT

DRAWN BY MGB
DATE 6/07/2010
CHK'D
DATE
APP'D
DATE
SCALE 1"–60'–0"

VMS ENVIRONMENTAL DEVELOPEMENT, LLC
LYNWOOD, ILLINOIS

ARCHITECHTURAL MSW PROCESS ROOMS GENERAL ARRANGEMENT AND SITE PLAN CHICAGO HEIGHTS FACILITY

DRAWING NO. 7715–001
SHT 1 OF 1
REVISION G



* Material throughput numbers are for mass balance purposes only.
Does not reflect actual facility material throughput.

ILLINOIS RECYCLING AND RENEWABLE FUELS, LLC
CHICAGO HEIGHTS, IL
STATE STREET MSW RECYCLING AND FACILITY
PROCESS FLOW AND MASS BALANCE SHEET

FIGURE 3

Process Flow and Mass Balance

SUPERIOR ENGINEERING, LLC
Hammond, IN

PROJECT	SHEET	W.O.	VERSION	PLOT DATE
780038	7715-009		2002	04/06/2011

REVISIONS		
NO	DATE	BY
1		
2		
3		
4		
5		

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PROJECT NAME
ILLINOIS RECYCLING AND
RENEWABLE FUELS (IRRF)
CHICAGO HEIGHTS RECYCLING PLANT

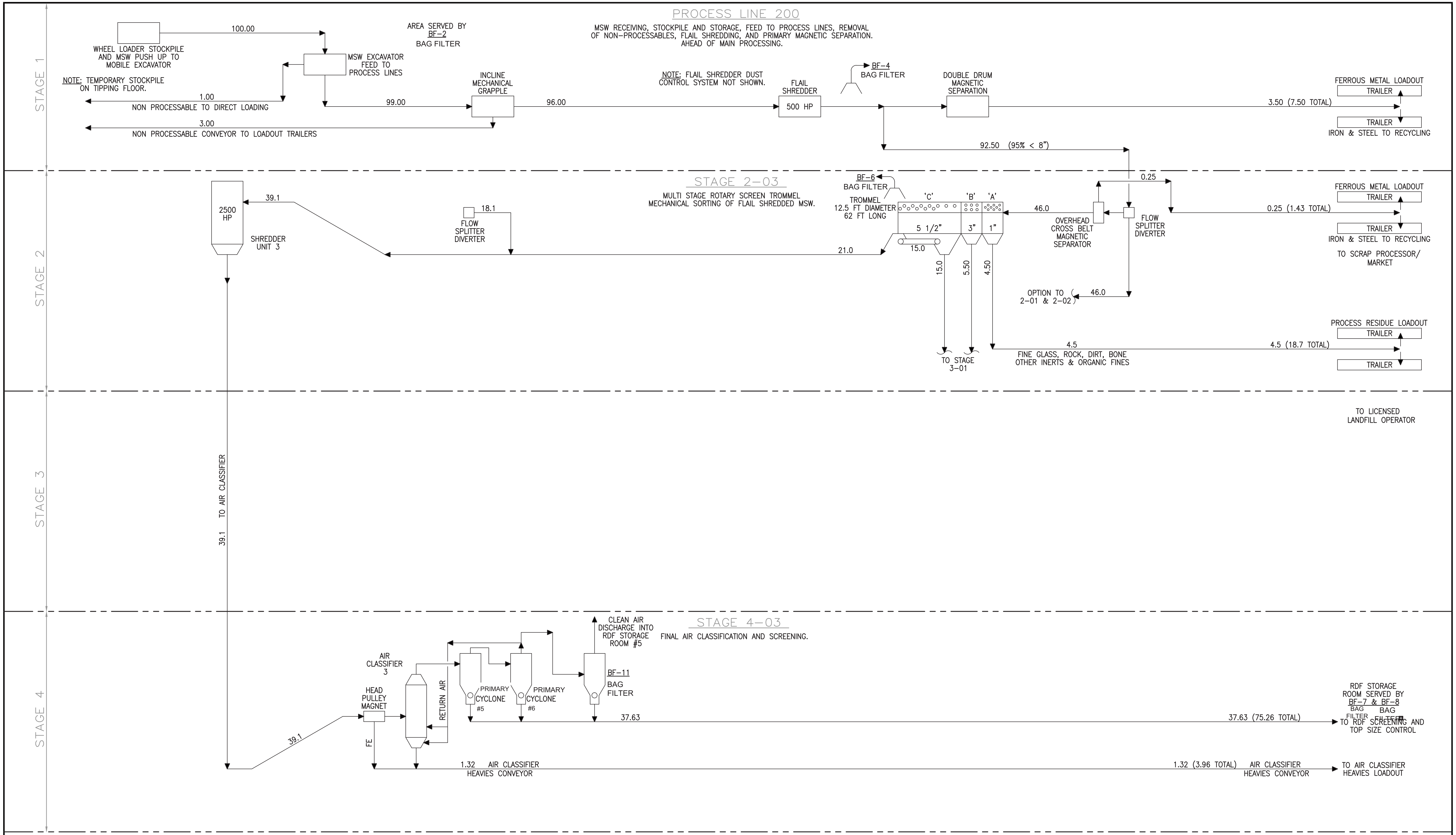
DRAWN BY MGB
DATE 6/22/2010
CHK'D
DATE
APP'D
DATE
SCALE FULL SIZE

VMS ENVIRONMENTAL DEVELOPEMENT, LLC
LYNWOOD, ILLINOIS

PROCESS FLOW AND
MSW MASS BALANCE

CHICAGO HEIGHTS FACILITY

DRAWING NO. 7715–009–01
SHT 1 OF 2
REVISION F



* Material throughput numbers are for mass balance purposes only.
Does not reflect actual facility material throughput.

ILLINOIS RECYCLING AND RENEWABLE FUELS, LLC
CHICAGO HEIGHTS, IL
STATE STREET MSW RECYCLING AND FACILITY
PROCESS FLOW AND MASS BALANCE SHEET

FIGURE 4

Process Flow and Mass Balance

SUPERIOR ENGINEERING, LLC
Hammond, IN

PROJECT	SHEET	W.O.	VERSION	PLOT DATE
780038	7715-009		2002	04/06/2011

REVISIONS		
NO	DATE	BY
1		
2		
3		
4		
5		

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PROJECT NAME ILLINOIS RECYCLING AND RENEWABLE FUELS (IRRF) CHICAGO HEIGHTS RECYCLING PLANT

DRAWN BY MGB
DATE 6/22/2010
CHK'D
DATE
APP'D
DATE
SCALE FULL SIZE

VMS ENVIRONMENTAL DEVELOPEMENT, LLC
LYNWOOD, ILLINOIS

PROCESS FLOW AND MSW MASS BALANCE

CHICAGO HEIGHTS FACILITY

DRAWING NO. 7715-009-02
SHT 1 OF 2
REVISION F

TABLE 1

EXHAUST POINT INFORMATION

I.D	*Site Location*	*Emissions Control Equipment*	*Emissions Control Efficiency*[2]	*Maximum PM Process Emissions Based on Material Throughputs*				*Maximum Exit Flow Rate*[2]	*Grain Loading*[2]	*Maximum PM Process Emissions Based on Grain Loading*	
				Uncontrolled		*Controlled*				*Controlled*	
				(lb/hr)	*(ton/yr)*[1]	*(lb/hr)*	*(ton/yr)*[1]	*(CFM)*	*(gr/scf)*	*(lb/hr)*	*(ton/yr)*[1]
MSW V1	Room 1	N/A	N/A	N/A	N/A	N/A	N/A	10,000	N/A	N/A	N/A
MSW V2	Room 1	N/A	N/A	N/A	N/A	N/A	N/A	10,000	N/A	N/A	N/A
MSW V3	Room 1	N/A	N/A	N/A	N/A	N/A	N/A	10,000	N/A	N/A	N/A
MSW V4	Room 1	N/A	N/A	N/A	N/A	N/A	N/A	10,000	N/A	N/A	N/A
MSW V5	Room 1	N/A	N/A	N/A	N/A	N/A	N/A	10,000	N/A	N/A	N/A
ROOM 1 TOTALS				**N/A**	**N/A**	**N/A**	**N/A**	**50,000**		**N/A**	**N/A**
MSW V6	Room 2	BF-1	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V7	Room 2	BF-1	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V8	Room 2	BF-1	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V9	Room 2	BF-1	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V10	Room 2	BF-1	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V11	Room 2	BF-2	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V12	Room 2	BF-2	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V13	Room 2	BF-2	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V14	Room 2	BF-2	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
MSW V15	Room 2	BF-2	99.0%	10.00	43.80	0.10	0.44	10,000	0.001	0.09	0.38
ROOM 2 TOTALS				**100.00**	**438.00**	**1.00**	**4.38**	**100,000**		**0.86**	**3.75**
MSW FBO1	Room 3A	BF-3	99.0%	10.00	43.80	0.10	0.44	10,000	0.005	0.43	1.88
MSW FBO2	Room 3B	BF-4	99.0%	10.00	43.80	0.10	0.44	10,000	0.005	0.43	1.88
ROOM 3 TOTALS				**20.00**	**87.60**	**0.20**	**0.88**	**20,000**		**0.86**	**3.75**
Room 4	Room 4	BF-6	99.0%	25.00	109.50	0.25	1.10	30,000	0.005	1.29	5.63
MSW AC1	Room 4	BF-9	N/A	N/A	N/A	N/A	N/A	30,000	N/A	N/A	N/A
MSW AC2	Room 4	BF-10	N/A	N/A	N/A	N/A	N/A	30,000	N/A	N/A	N/A
MSW AC3	Room 4	BF-11	N/A	N/A	N/A	N/A	N/A	30,000	N/A	N/A	N/A
MSW AC4	Room 4	BF-5	99.0%	50.00	219.00	0.50	2.19	7,500	0.005	0.32	1.41
ROOM 4 TOTALS				**75.00**	**328.50**	**0.75**	**3.29**	**127,500**		**1.61**	**7.04**
RDF V16	Room 5	BF-8	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V17	Room 5	BF-8	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V18	Room 5	BF-8	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V19	Room 5	BF-8	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V20	Room 5	BF-8	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V21	Room 5	BF-7	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V22	Room 5	BF-7	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V23	Room 5	BF-7	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V24	Room 5	BF-7	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
RDF V25	Room 5	BF-7	99.0%	15.00	65.70	0.15	0.66	10,000	0.001	0.09	0.38
ROOM 5 TOTALS				**150.00**	**657.00**	**1.50**	**6.57**	**100,000**		**0.86**	**3.75**
FACILITY TOTALS				**345.00**	**1,511.10**	**3.45**	**15.11**	**347,500**		**4.18**	**18.30**

[1] Hours of operation 8,760 hr/yr

[2] Manufacturer design specification.

Sample Calculations:

Maximum PM Process Emissions Based on Material Throughputs	Maximum PM Process Emissions Based on Grain Loading
10 [lb/hr] x (1-0.99) [Control Efficiency] = 0.10 [lb/hr]	*10,000 [cfm] x 0.004 [gr/scf] x 60 [sec/min] / 7,000 [gr/lb] = 0.34 [lb/hr]*
43.80 [ton/yr] x (1-0.99) [Control Efficiency] = 0.44 [ton/yr]	*10,000 [cfm] x 0.004 [gr/scf] x 60 [sec/min] / 7,000 [gr/lb] x 8,760 [hr/yr] / 2,000 [lb/ton]= 1.5 [ton/yr]*

Air flow from Air Classifiers 1-3 is ducted to Room 5 before exhausting through either BF-7 or BF-8.

TABLE 2

BAG FILTER UNIT INFORMATION

I.D	***Description***	***General Emission Unit Information***							
		Site Location	*Manufacturer*	*Model Number*	*Serial Number*	*Maximum/Typical Operating Information*			
						(hrs/day)	*(days/wk)*	*(wks/yr)*	*(hrs/yr)*
BF-1	MSW BF-1	Room 2	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-2	MSW BF-2	Room 2	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-3	FBF-3	Room 3	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-4	FBF-4	Room 3	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-5	MSW BF-5	Room 4	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-6	MSW BF-6	Room 4	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-7	RDF BF-7	Room 5	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-8	RDF BF-8	Room 5	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-9	MSW BF-9	Room 4	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-10	MSW BF-10	Room 4	MAC Equipment	TBD	TBD	24	7	52	8,760
BF-11	MSW BF-11	Room 4	MAC Equipment	TBD	TBD	24	7	52	8,760

I.D	***Emission Unit Exhaust Point Information***					***Filter Information***				
	Exit Gas Temp (F)		***Distance to Plant Boundary***	***Discharge Height***	***Stack Diameter***	***Control Type***	***Filter Material***	***Filtering Area***	***Air/Cloth Ratio***	***Inlet Flow Rate***
	Maximum	***Typical***	***(feet)***	***(feet)***	***(feet)***			***(sq. ft.)***	***(feet/min)***	***(scfm)***
BF-1	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Nanofiber	16,667	3:1	50,000
BF-2	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Nanofiber	16,667	3:1	50,000
BF-3	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	2,000	5:1	10,000
BF-4	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	2,000	5:1	10,000
BF-5	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	1,500	5:1	7,500
BF-6	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	10,000	3:1	30,000
BF-7	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Nanofiber	16,667	3:1	50,000
BF-8	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Nanofiber	16,667	3:1	50,000
BF-9	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	10,000	3:1	30,000
BF-10	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	10,000	3:1	30,000
BF-11	Ambient	Ambient	TBD	TBD	TBD	Fabric Filter	Polyester	10,000	3:1	30,000

TABLE 3

PROCESS WEIGHT RATE RULE THROUGHPUT CALCULATIONS

Process Weight Rate		***Operations***		***PWR Factors***		***Allowable Emissions***	
P						***E***	
(ton/hr)	***(ton/day)***	***(hr/day)***	***(day/yr)***	***A***	***B***	***(lb/hr)***	***(ton/yr)***
169	2,704	16	365	2.54	0.534	39.31	172.18*

The allowable emission rate was determined by using the equation in 35 IAC 212.321(b) as follows:

$$E = A(P)^B$$

where

P = Process weight rate; and
E = Allowable emission rate; and
A = 2.54; and
B = 0.534

Pound per Hour Calculation

2.54 [constant] x (169 [ton/day] ^ 0.534 [constant] = 39.31 [lb/hr]

* Based on 8,760 hours of operation.

TABLE 4

FUGITIVE ROAD DUST EMISSIONS

Truck Type	*Trucks Per Year*	*Round Trip Distance*	*Vehicle Miles Traveled*	*Potential Emissions*			
				Uncontrolled PM[1]	*Controlled PM*[2]	*Uncontrolled PM_{10}*[1]	*Controlled PM_{10}*[2]
		(miles/trip)	*(miles/year)*	*(tpy)*	*(tpy)*	*(tpy)*	*(tpy)*
MSW Transfer Trailer	14,600	0.5	7,300	1.81	0.90	0.35	0.18
MSW Packer Truck	40,150	0.5	20,075	3.23	1.62	0.63	0.32
Recycled Product & Residue Truck	29,200	0.5	14,600	3.62	1.81	0.71	0.35
Empolyee & Contractor Vehicles	36,500	0.5	18,250	0.14	0.07	0.03	0.01
On-Site Shuttle Tractor Trailer	29,200	0.25	7,300	0.89	0.45	0.17	0.09
TOTALS	**149,650**		**67,525**	**9.70**	**4.85**	**1.89**	**0.95**

[1] From Paved Roads Worksheet (See Appendix E)

[2] 50% reduction based on utilization of fugitive dust plan.

Operating Scenarios

Days of Operation	**365**	days/yr	
MSW Delivery			
Transfer trailer tare weight	15	tons	Nominal industry standard
Maximum full transfer trailer weight	40	tons	OTR truck weight capacity
Average transfer trailer weight	27.5	tons	Based on roundtrip
Transfer trailer delivery frequency	40	trucks/day	Plant design
	14,600	trucks/yr	Plant design
Packer truck tare weight	7	tons	Nominal industry standard
Maximum full packer truck weight	30	tons	Packer truck weight capacity
Average packer truck weight	18.5	tons	Based on roundtrip
Packer truck delivery frequency	110	trucks/day	Plant design
	40,150	trucks/yr	Plant design
Recycle Product & Residue Hauling			
Recycle product & residue truck tare weight	15	tons	Nominal industry standard
Maximum full truck weight	40	tons	OTR truck weight capacity
Average truck weight	27.5	tons	Based on roundtrip
Recycle product & residue truck haul frequency	80	trucks/day	Plant design
	29,200	trucks/yr	Plant design
Employee & Contrator Vehicles			
Passanger vehicle tare weight	2	tons	Nominal industry standard
Passanger vehicle frequency	100	vehicles/day	Estimated
	36,500	vehicles/yr	Estimated
On-Site Shuttle Tractor Trailer			
On-site shuttle tractor trailer tare weight	15	tons	Nominal industry standard
Maximum full on-site shuttle tractor trailer weight	45	tons	OTR truck weight capacity
Average on-site shuttle tractor trailer weight	30	tons	Based on roundtrip
On-site shuttle tractor trailer haul frequency	80	trucks/day	Plant design
	29,200	trucks/yr	Plant design

* Table 4 is used to demonstrate maximum roadway fugitive particulate matter emissions from truck traffic. Maximum facility throughput of 2,704 tons per day will be based on weight and not the number of delivery trucks.

TABLE 5

LIST OF STATIONARY MATERIAL HANDLING EQUIPMENT, ROOM LOCATION, AND ASSOCIATED CONTROL DEVICE

Stationary Equipment	*Number of Units*	*Building Location*	*Control Device Designation**
Picking Grapples	2	Room 2	BF1 & BF2
Flail (Bag Openers)	2	Room 3	BF3 & BF4
Drum Type Primary Electro Magnets	2	Room 3	BF3 & BF4
Drum Type Permanent Magnets	2	Room 3	BF3 & BF4
Suspended Belt Type Secondary Electro Magnets	3	Room 4	BF5 & BF6
Suspended Belt Type Tertiary Permanent Magnets	3	Room 4	BF5 & BF6
Drum Type Permanent Magnets	3	Room 4	BF5 & BF6
Conveyor Head Pulley Magnets	5	Room 4	BF5 & BF6
Primary Trommels	3	Room 4	BF5 & BF6
Shredders	3	Room 4	**
Air Classifiers	4	Room 4	***
Cyclone Separators	7	Room 4	****
Secondary Trommels	2	Room 4	BF5 & BF6
Disc Screens	2	Room 4	BF5 & BF6
Stationary Packers - RDF Storage Room	2	Room 5	BF7 & BF8
Stationary Packers - RDF Loadout	4	Room 5	BF7 & BF8

* BF = Bag Filter

** Air flow from shredders 1, 2, & 3 is ducted through BF-9, BF-10, & BF-11 before being exhausted to Room 5. Room 5 is exhausted through BF-7 & BF-8.

*** Air flow from air classifiers 1, 2, & 3 is ducted through BF-9, BF-10, & BF-11 before being exhausted to Room 5. Room 5 is exhausted through BF-7 & BF-8. Air flow from air classifier 4 is ducted through BF-5.

**** Air flow from primary cyclone seperators 1-6 is ducted through BF-9, BF-10, & BF-11 before being exhausted to Room 5. Room 5 is exhausted through BF-7 & BF-8. Air flow from secondary cyclone seperator 1 is ducted through BF-5.

APPENDIX A

SITING APPROVAL (RESOLUTION NO 2009-15)

STATE OF ILLINOIS)
COUNTY OF COOK) SS
CITY OF CHICAGO HEIGHTS)

RESOLUTION NO. 2009-15

A RESOLUTION OF THE CITY OF CHICAGO HEIGHTS, COOK COUNTY ILLINOIS ADOPTING THE FINDINGS AND RECOMMENDED CONDITIONS OF THE APPLICANT, AND GRANTING INDIANA RECYCLING AND RENEWABLE FUELS'S REQUEST FOR SITING APPROVAL FOR A SOLID WASTE TRANSFER STATION AND TREATMENT FACILITY AT 1301 SOUTH STATE STREET, CHICAGO HEIGHTS, ILLINOIS

WHEREAS, on or about January 26, 2009, Indiana Recyclable and Renewable Fuels, LLC (hereinafter the "Applicant") filed an application for local siting approval for a pollution control facility with the City of Chicago Heights, for a solid waste transfer station and treatment facility proposed to be located on an approximate 25 acre parcel located at 1301 South State Street, Chicago Heights, Illinois (hereinafter the "Application"); and

WHEREAS, following proper notice of the filing of the Application and of the public hearing, the public hearing on the Application was conducted on April 28, 2009, by Applicant's attorney, Thomas Planera II; and

WHEREAS, at the public hearing on the Application, the Applicant's attorney, Thomas Planera II, testified on all nine of the statutory substantive siting criteria; and

WHEREAS, the City of Chicago Heights's independent expert, Robinson Engineering, reviewed the Application and found that the Application meets all of the criteria necessary for siting under Section 39.2 of the Illinois Environmental Protection Act; and

WHEREAS, members of the general public were present and registered to participate during the public hearing; and

WHEREAS, all of the public comment provided at the hearing was in favor of and supported the granting of local siting approval by the City of Chicago Heights; and

WHEREAS, the City Council of the City of Chicago Heights has reviewed the Application and determined that it is complete; and

WHEREAS, the City Council of the City of Chicago Heights has reviewed the record of proceedings and determined that all of the statutory criteria for siting a pollution control facility have been met.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF CHICAGO HEIGHTS, as follows:

1. That the foregoing recitals are found to be true and correct and are hereby incorporated as part of this Resolution;

2. That the City Council of the City of Chicago Heights concurs with the opinion of the City of Chicago Heights's independent expert, Robinson Engineering;

3. That the City Council of Chicago Heights hereby adopts the Applicant's finding of Fact, Conclusions of Law and Recommendations filed in this matter and hereby grants local siting approval to the Applicant.

Alex Lopez, Mayor

Presented:__________
Passed:__________

Yeas: 6
Nays: 0
Recorded:__________
Published:__________
Absent: 0
Attest:

Ethel Taylor, City Clerk

Illinois
Environmental
Protection Agency

Bureau of Land
1021 North Grand Avenue East
Box 19276
Springfield, IL 62794-9276

CERTIFICATION OF SITING APPROVAL (LPC-PA8)

Name of Applicant for Siting: Indiana Recycling and Renewable Fuels, LLC

Address of Siting Applicant: Same

Name of Site: 1301 South State Street   Site Number (if assigned): NA

Site Information: Nearest Municipality: City of Chicago Heights   County: Cook

Unit of local government from which siting approval was obtained: City of Chicago Heights

1. On May 18 (Date), 2009, the City Council (Governing body of county or municipality) of the City of Chicago Heights (County or municipality) approved the site location suitability of 1301 South State Street (Name of site) as a new pollution control facility in accordance with Section 39.2 of the Illinois Environmental Protection Act, Ill. Rev. Stat., ch 111 ½ , Section 1039.2.

2. The Illinois EPA may need to verify the information on this form, please indicate a person from the unit of local government ("siting authority") whom a representative from the Illinois EPA may contact regarding this approval:

   Ethel Taylor, City Clerk
   (Name, title, and telephone number)

3. Identify the type of activity(ies) for which local siting approval was obtained:
   waste storage (☐), sanitary landfill (☐), waste disposal (☐), waste transfer (☒), waste treatment (☒), waste incinerator (☐).

4. Did the local siting authority approve the acceptance of special waste? ☐ Yes ☒ No
   Did the local siting authority approve the acceptance of hazardous waste? ☐ Yes ☒ No

5. Attached to this certification is a true and correct statement of the legal descriptions of the site as it was approved by the aforementioned local siting authority. ☒ Yes ☐ No
   (Note: A legal description must be attached to this document, by the local siting authority, to make the application complete)

IL 532 1429
LPC 218 Rev. March 2003

This Agency is authorized to require this information under Illinois Revised Statutes, 1979, Chapter 111 1/2, Section 1039. Disclosure of this information is required under that Section. Failure to do so may prevent this form from being processed and could result in your application being denied. This form has been approved by the Forms Management Center.

6. Did the local siting authority impose any specific condition(s)? ☐ Yes ☒ No
If yes, is a copy of the conditions attached to this form? ☐ Yes ☐ No
(Note: These conditions are provided for information only to the Illinois EPA. The Illinois EPA is not obligated to monitor nor enforce local conditions.)

7. **This item is applicable only to landfills or disposal sites.**
Was a legal description of horizontal and vertical waste? boundaries approved? (i.e., the waste envelop). ☐ Yes ☐ No ☒ N/A

If no, is there a maximum disposal capacity approved? (i.e., the waste envelop). ☐ Yes ☐ No ☒ N/A

If either of the questions under #7 above was answered yes, the legal description or maximum capacity must be attached to this form by the local siting authority to make the application complete.

8. The undersigned has been authorized by the Mayor, Alex Lopez of
(siting authority of county or municipality)
the City of Chicago Heights to execute this certification on their behalf.
(county or municipality)

Name: Ethel Taylor

Signature:

Title: City Clerk

SUBSCRIBED AND SWORN TO BEFORE ME
this 18th day of May, 2009

"OFFICIAL SEAL"
MARIA R. KELLY
Notary Public, State of Illinois
My Commission Expires 12-27-09

Maria R Kelly
Notary Public

bjh\002892i.doc

STATE OF ILLINOIS)
COUNTY OF COOK) ss
CITY OF CHICAGO HEIGHTS)

I, Ethel M. Taylor, duly appointed and acting City Clerk of the City of Chicago Heights, Illinois and as such the keeper of the records of the City Council of the City of Chicago Heights, Illinois do hereby certify that the attached copy of

RESOLUTION NO. 2009-15

A RESOLUTION OF THE CITY OF CHICAGO HEIGHTS, COOK COUNTY, ILLINOIS ADOPTING THE FINDINGS AND RECOMMENDED CONDITIONS OF THE APPLICANT, AND GRANTING INDIANA RECYCLING AND RENEWABLE FUEL'S REQUEST FOR SITING APPROVAL FOR A SOLID WASTE TRANSFER STATION AND TREATMENT FACILITY AT 1301 SOUTH STREET, CHICAGO HEIGHTS, ILLINOIS

is a true and correct copy of the original now on file in the City Hall, Chicago Heights, Illinois.

***IN WITNESS WHEREOF*, I have signed my name and affixed the seal of the City of Chicago Heights, Illinois this 28th day of May, 2009.**

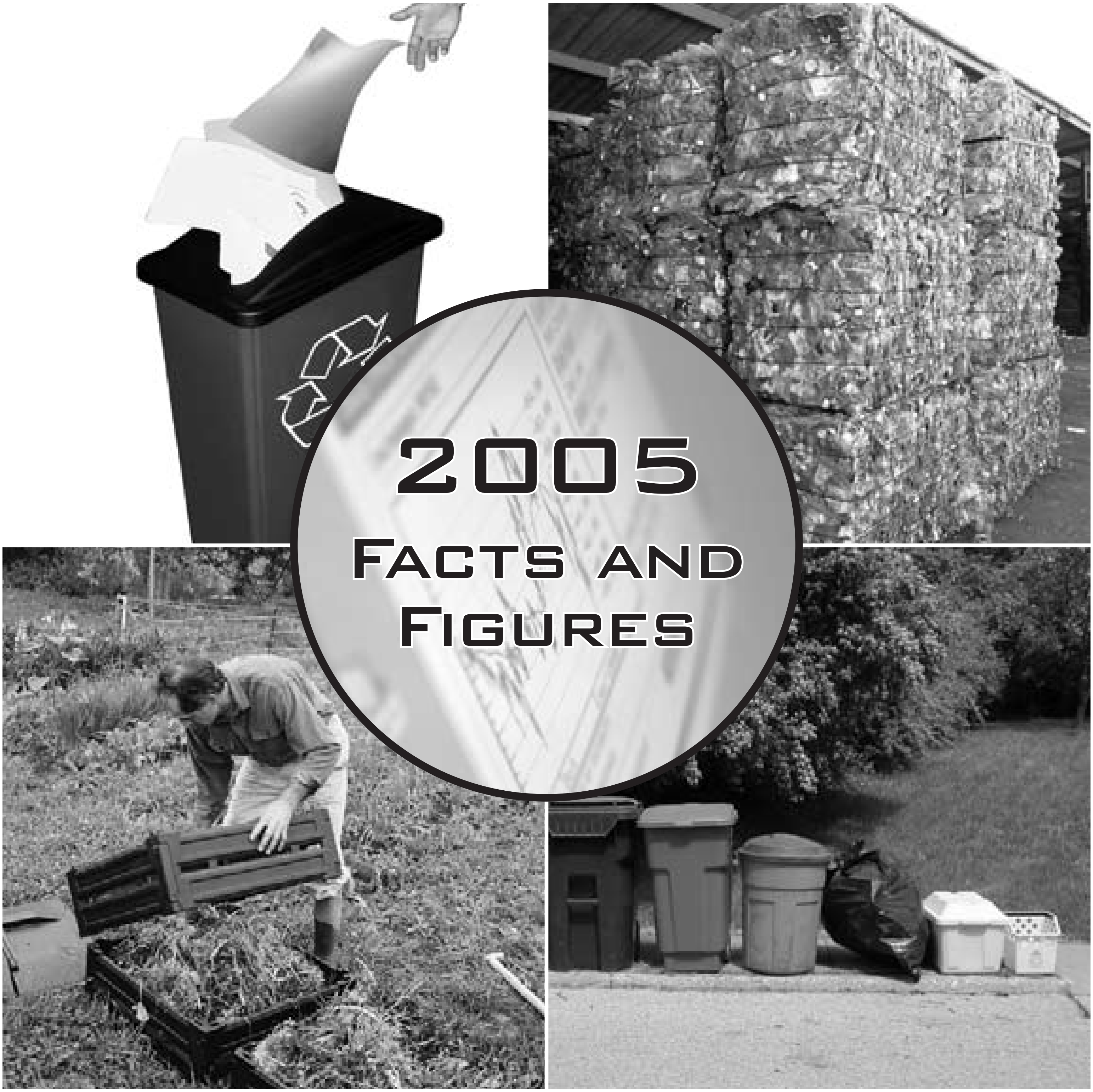
Ethel M. Taylor, City Clerk

(SEAL)

APPENDIX B

MUNICIPAL SOLID WASTE IN THE UNITED STATES: 2005 FACTS AND FIGURES

MUNICIPAL SOLID WASTE IN THE UNITED STATES



2005

FACTS AND FIGURES

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

United States Environmental Protection Agency
Office of Solid Waste (5306P)
EPA530-R-06-011
October 2006
www.epa.gov

MUNICIPAL SOLID WASTE IN
THE UNITED STATES:
2005 FACTS AND FIGURES

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MUNICIPAL SOLID WASTE
IN THE UNITED STATES: 2005 FACTS AND FIGURES

EXECUTIVE SUMMARY

OVERVIEW

This report describes the national municipal solid waste (MSW) stream based on data collected for 1960 through 2005. The historical perspective is useful for establishing trends in types of MSW generated and in the ways it is managed. In this Executive Summary, we briefly describe the methodology used to characterize MSW in the United States and provide the latest facts and figures on MSW generation, recycling, and disposal.

In the United States, we generated approximately 245.7 million tons of MSW in 2005—a decrease of 1.6 million tons from 2004. Excluding composting, the amount of MSW recycled increased to 58.4 million tons, an increase of 1.2 million tons from 2004. This is a 2 percent increase in the tons recycled. The tons recovered for composting rose slightly to 20.6 million tons in 2005, up from 20.5 million tons in 2004. The recovery rate for recycling (including composting) was 32.1 percent in 2005, up from 31.4 percent in 2004.[1] (See Tables ES-1 and ES-2 and Figures ES-1 and ES-2.)

MSW generation in 2005 declined to 4.54 pounds per person per day. This is a decrease of 1.5 percent from 2004 to 2005. The recycling rate in 2005 was 1.46 pounds per person per day. Discards sent to a landfill after recycling declined to 2.46 pounds per person per day in 2005 (Table ES-3).

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[1] Data shown for 2000 through 2004 have been adjusted to reflect the latest revisions and, therefore, may differ from the same measure reported previously.

Table ES-1

GENERATION, MATERIALS RECOVERY, COMPOSTING, COMBUSTION WITH ENERGY RECOVERY, AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2005

(in millions of tons)

Activity	1960	1970	1980	1990	2000	2003	2004	2005
Generation	88.1	121.1	151.6	205.2	237.6	240.4	247.3	245.7
Recovery for recycling	5.6	8.0	14.5	29.0	52.7	55.8	57.2	58.4
Recovery for composting*	Neg.	Neg.	Neg.	4.2	16.5	19.1	20.5	20.6
Total materials recovery	5.6	8.0	14.5	33.2	69.1	74.9	77.7	79.0
Combustion with energy recovery†	0.0	0.4	2.7	29.7	33.7	33.7	34.1	33.4
Discards to landfill, other disposal‡	82.5	112.7	134.4	142.3	134.8	131.9	135.5	133.3

* Composting of yard trimmings, food scraps and other MSW organic material.
Does not include backyard composting.

† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

‡ Discards after recovery minus combustion with energy recovery. Discards include combustion without energy recovery.
Details may not add to totals due to rounding.

Table ES-2

GENERATION, MATERIALS RECOVERY, COMPOSTING, COMBUSTION WITH ENERGY RECOVERY, AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2005

(in percent of total generation)

Activity	1960	1970	1980	1990	2000	2003	2004	2005
Generation	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Recovery for recycling	6.4%	6.6%	9.6%	14.2%	22.2%	23.2%	23.1%	23.8%
Recovery for composting*	Neg.	Neg.	Neg.	2.0%	6.9%	7.9%	8.3%	8.4%
Total materials recovery	6.4%	6.6%	9.6%	16.2%	29.1%	31.1%	31.4%	32.1%
Combustion with energy recovery†	0.0%	0.3%	1.8%	14.5%	14.2%	14.0%	13.8%	13.6%
Discards to landfill, other disposal‡	93.6%	93.1%	88.6%	69.3%	56.7%	54.9%	54.8%	54.3%

* Composting of yard trimmings, food scraps and other MSW organic material.
Does not include backyard composting.

† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

‡ Discards after recovery minus combustion with energy recovery. Discards include combustion without energy recovery.
Details may not add to totals due to rounding.

Table ES-3
GENERATION, MATERIALS RECOVERY, COMPOSTING COMBUSTION WITH ENERGY RECOVERY, AND DISCARDS OF MUNICIPAL SOLID WASTE, 1960 - 2005
(in pounds per person per day)

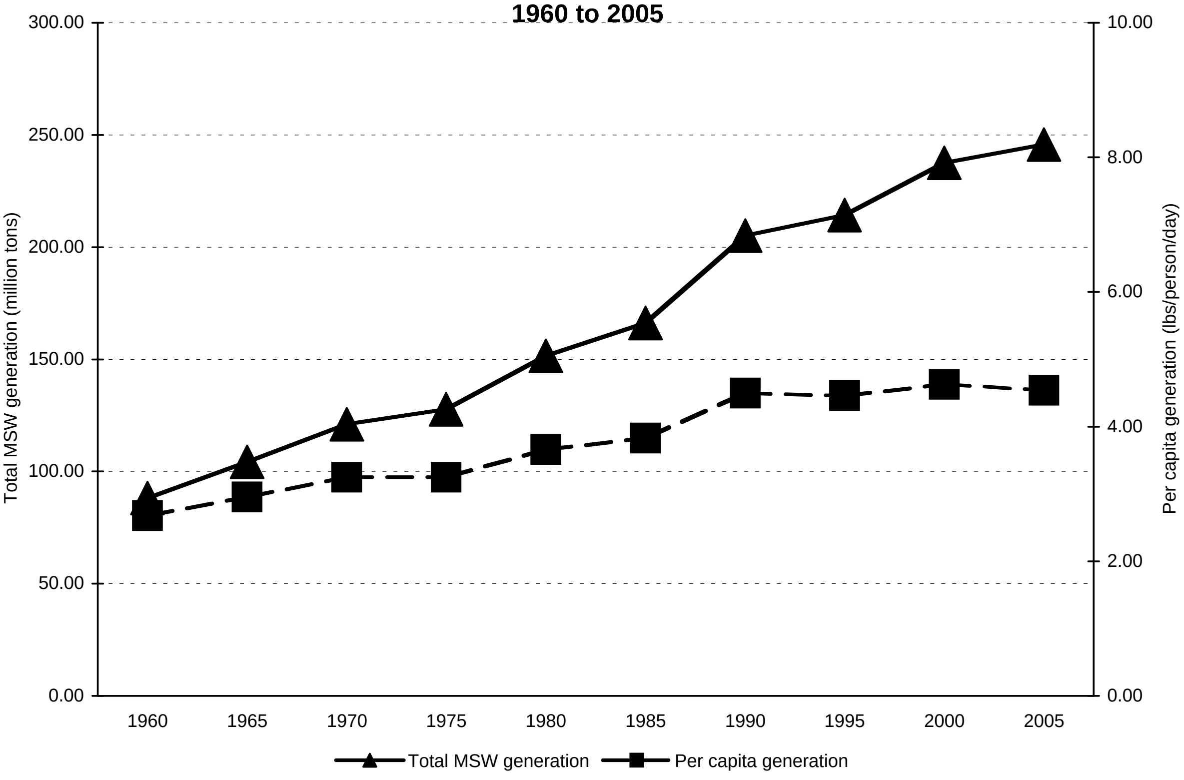
Activity	1960	1970	1980	1990	2000	2003	2004	2005
Generation	2.68	3.25	3.66	4.50	4.63	4.53	4.61	4.54
Recovery for recycling	0.17	0.22	0.35	0.64	1.03	1.05	1.07	1.08
Recovery for composting*	Neg.	Neg.	Neg.	0.09	0.32	0.36	0.38	0.38
Total materials recovery	0.17	0.22	0.35	0.73	1.35	1.41	1.45	1.46
Combustion with energy recovery†	0.00	0.01	0.07	0.65	0.66	0.63	0.64	0.62
Discards to landfill, other disposal‡	2.51	3.02	3.24	3.12	2.62	2.49	2.52	2.46
Population (millions)	179.979	203.984	227.255	249.907	281.422	290.850	293.660	296.410

* Composting of yard trimmings, food scraps and other MSW organic material. Does not include backyard composting.

† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets and tire-derived fuel).

‡ Discards after recovery minus combustion with energy recovery. Discards include combustion without energy recovery. Details may not add to totals due to rounding.

Figure ES-1: MSW Generation Rates, 1960 to 2005



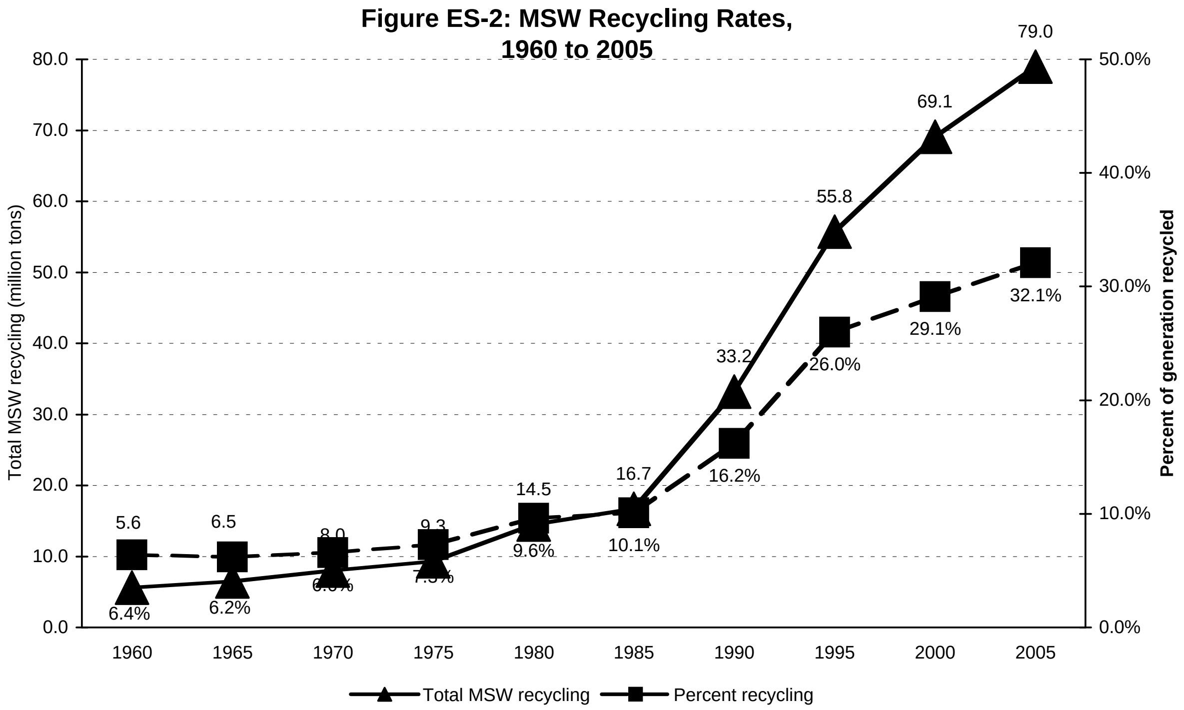


Figure ES-2: MSW Recycling Rates, 1960 to 2005

The state of the economy has a strong impact on consumption and waste generation. Waste generation continued to increase through the 1990s as economic growth continued to be strong. Between 2000 and 2005, total growth in waste generation slowed. On a per capita basis, 2005 waste generation at 4.54 pounds per person per day is only slightly higher than the 1990 rate of 4.50 pounds per person per day.

WHAT IS INCLUDED IN MUNICIPAL SOLID WASTE?

MSW—otherwise known as trash or garbage—consists of everyday items such as product packaging, grass clippings, furniture, clothing, bottles, food scraps, newspapers, appliances, and batteries. Not included are materials that also may be disposed in landfills but are not generally considered MSW, such as construction and demolition debris, municipal wastewater treatment sludges, and non-hazardous industrial wastes.

MUNICIPAL SOLID WASTE IN PERSPECTIVE

Trends Over Time

Over the last few decades, the generation, recycling, and disposal of MSW have changed substantially (see Tables ES-1, ES-2, and ES-3 and Figures ES-1 and ES-2). MSW generation has continued to increase from 1960, when it was 88 million tons. The generation rate in 1960 was just 2.7 pounds per person per day; it grew to 3.7 pounds per person per day in 1980; reached 4.5 pounds per person per day in 1990; increased to 4.6 pounds per person per day in 2000; and returned to about 4.5 pounds per person per day in 2005.

Over time, recycling rates have increased from 10 percent of MSW generated in 1980 to 16 percent in 1990, to 29 percent in 2000, and to 32 percent in 2005. Disposal of waste to a landfill has decreased from 89 percent of the amount generated in 1980 to 54 percent of MSW in 2005.

MUNICIPAL SOLID WASTE IN 2005

The U.S. Environmental Protection Agency (EPA) uses two methods to analyze the 245.7 million tons of MSW generated in 2005. The first is by **material** (paper and paperboard, yard trimmings, food scraps, plastics, metals, glass, wood, rubber, leather and textiles, and other); the second is by several major **product** categories. The product-based categories are containers and packaging; nondurable goods (e.g., newspapers); durable goods (e.g., appliances); food scraps; and other materials.

Materials in MSW

A breakdown, by weight, of the MSW **materials** generated in 2005 is provided in Figure ES-3. Paper and paperboard made up the largest component of MSW generated (34 percent), and yard trimmings were the second-largest component (13 percent). Glass, metals, plastics, wood, and food scraps each constituted between 5 and 12 percent of the total MSW generated. Rubber, leather, and textiles combined made up about 7 percent of MSW, while other miscellaneous wastes made up approximately 3 percent of the MSW generated in 2005.

A portion of each material category in MSW was recycled or composted in 2005. The highest rates of recovery were achieved with yard trimmings, paper and paperboard products, and metal products. About 62 percent (19.9 million tons) of yard trimmings was recovered for composting in 2005. This represents nearly a five-fold increase since 1990. Fifty percent (42.0 million tons) of paper and paperboard was recovered for recycling in 2005. Recycling these organic materials alone diverted more than 25 percent of municipal solid waste from landfills and combustion facilities. In addition, about 6.9 million tons, or about 37 percent, of metals were recovered for recycling. Recycling rates for all materials categories in 2005 are listed in Table ES-4.

Figure ES-3: 2005 Total MSW Generation - 246 Million Tons (Before Recycling)

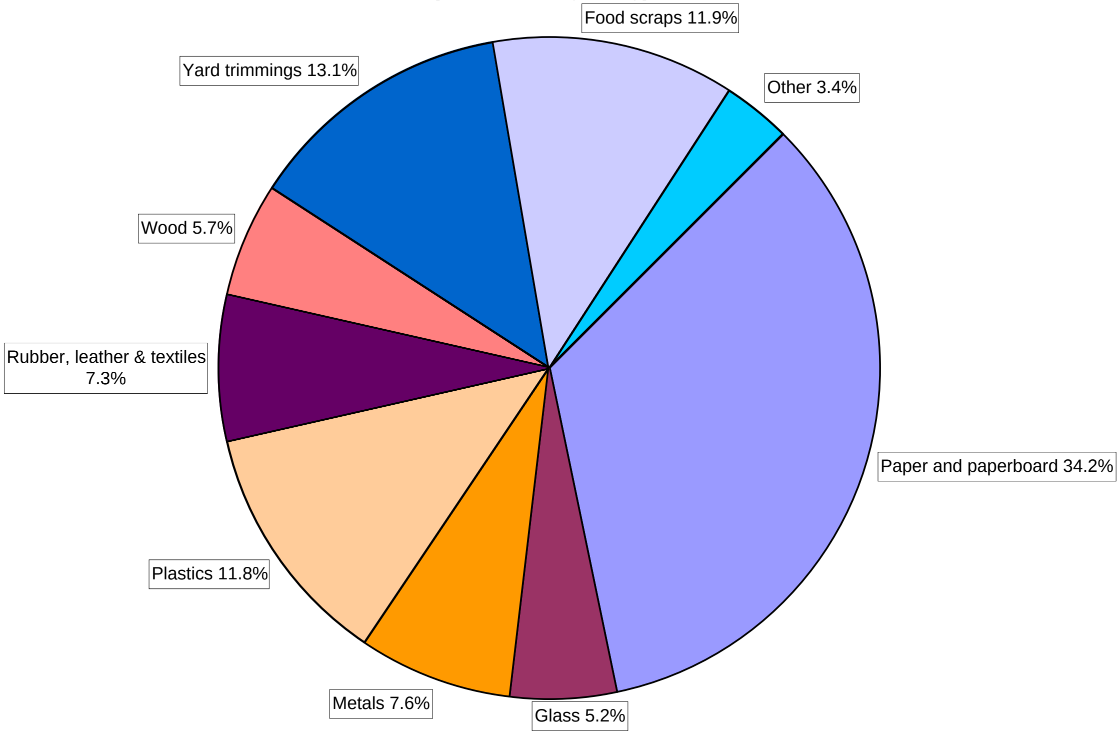


Table ES-4
GENERATION AND RECOVERY OF MATERIALS IN MSW, 2005
(in millons of tons and percent of generation of each material)

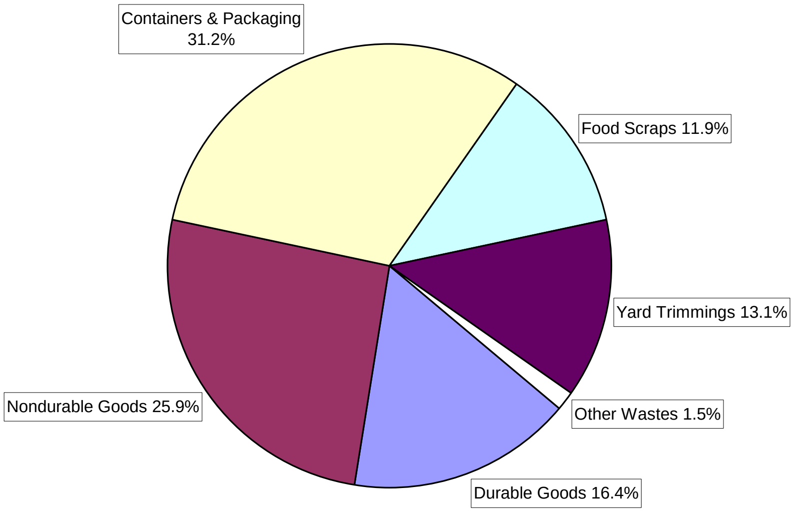
Material	**Weight Generated**	**Weight Recovered**	**Recovery As a Percent of Generation**
Paper and paperboard	84.0	42.0	50.0%
Glass	12.8	2.76	21.6%
Metals			
Steel	13.8	4.93	35.8%
Aluminum	3.21	0.69	21.5%
Other nonferrous metals*	1.74	1.26	72.4%
Total metals	18.7	6.88	36.8%
Plastics	28.9	1.65	5.7%
Rubber and leather	6.70	0.96	14.3%
Textiles	11.1	1.70	15.3%
Wood	13.9	1.31	9.4%
Other materials	4.57	1.17	25.6%
Total Materials in Products	180.7	58.4	32.3%
Other wastes			
Food, other**	29.2	0.69	2.4%
Yard trimmings	32.1	19.9	61.9%
Miscellaneous inorganic wastes	3.69	Neg.	Neg.
Total Other Wastes	65.0	20.6	31.6%
TOTAL MUNICIPAL SOLID WASTE	245.7	79.0	32.1%

Includes waste from residential, commercial, and institutional sources.
* Includes lead from lead-acid batteries.
** Includes recovery of other MSW organics for composting.
Details may not add to totals due to rounding.
Neg. = Less than 5,000 tons or 0.05 percent.

Products in MSW

The breakdown, by weight, of **product categories** generated in 2005 is shown in Figure ES-4. Containers and packaging comprised the largest portion of products generated, at 31 percent (76.7 million tons) of total MSW generation. Nondurable goods were the second-largest fraction, at 26 percent (63.7 million tons). The third-largest category of products is durable goods, which made up 16 percent (40.3 million tons) of total MSW generation.

Figure ES-4: Products Generated in MSW, 2005
(Total Weight = 246 million tons)



The generation and recovery of the product categories in MSW in 2005 are shown in Table ES-5. This table shows that recovery of containers and packaging was the highest of the three product categories—39.8 percent of containers and packaging generated in 2005 were recovered for recycling. About 45 percent of all aluminum cans was recovered (36.3 percent of all aluminum packaging, including foil), while 63.3 percent of steel packaging (mostly cans) was recovered. Paper and paperboard containers and packaging were recovered at a rate of 58.8 percent; corrugated containers accounted for most of that amount.

Approximately 25 percent of glass containers was recovered, while about 15 percent of wood packaging (mostly wood pallets removed from service) was recovered for recycling. More than 9 percent of plastic containers and packaging were recovered—mostly soft drink, milk, and water bottles.

Table ES-5
GENERATION AND RECOVERY OF PRODUCTS IN MSW BY MATERIAL, 2005
(in millons of tons and percent of generation of each product)

Products	Weight Generated	Weight Recovered	Recovery as a Percent of Generation
Durable Goods			
Steel	11.4	3.43	30.1%
Aluminum	1.08	Neg.	Neg.
Other non-ferrous metals*	1.74	1.26	72.4%
Total metals	14.2	4.69	33.0%
Glass	1.83	Neg.	Neg.
Plastics	8.71	0.37	4.2%
Rubber and leather	5.68	0.96	16.9%
Wood	5.37	Neg.	Neg.
Textiles	3.02	0.28	9.3%
Other materials	1.45	1.17	80.7%
Total durable goods	40.3	7.47	18.5%
Nondurable Goods			
Paper and paperboard	44.9	19.0	42.4%
Plastics	6.55	Neg.	Neg.
Rubber and leather	0.99	Neg.	Neg.
Textiles	7.91	1.42	18.0%
Other materials	3.36	Neg.	Neg.
Total nondurable goods	63.7	20.5	32.1%
Containers and Packaging			
Steel	2.37	1.50	63.3%
Aluminum	1.90	0.69	36.3%
Total metals	4.27	2.19	51.3%
Glass	10.9	2.76	25.3%
Paper and paperboard	39.0	22.9	58.8%
Plastics	13.7	1.28	9.4%
Wood	8.56	1.31	15.3%
Other materials	0.24	Neg.	Neg.
Total containers and packaging	76.7	30.5	39.8%
Other Wastes			
Food, other**	29.2	0.69	2.4%
Yard trimmings	32.1	19.9	61.9%
Miscellaneous inorganic wastes	3.69	Neg.	Neg.
Total other wastes	65.0	20.6	31.6%
TOTAL MUNICIPAL SOLID WASTE	245.7	79.0	32.1%

Includes waste from residential, commercial, and institutional sources.

* Includes lead from lead-acid batteries.

** Includes recovery of other MSW organics for composting.

Details may not add to totals due to rounding.

Neg. = Less than 5,000 tons or 0.05 percent.

Overall recovery of *nondurable goods* was at 32.1 percent in 2005. Most of this recovery comes from paper products such as newspapers and high-grade office papers (e.g., white papers). Newspapers constituted the largest portion of this recovery, with 88.9 percent of newspapers generated being recovered for recycling. An estimated 62.6 percent of high-grade office papers and 38.5 percent of magazines was recovered in 2005. Newspaper, high-grade office paper, and magazine recovery increased in percentage between 2004 and 2005.

Recovery percentage of "Other Commercial Printing" stayed about the same at 10.4 percent. The other paper products in the nondurable goods category increased slightly between 2004 and 2005, with Standard mail[*] recovered at an estimated 35.8 percent, and directories at an estimated 18.2 percent.

The nondurable goods category also includes clothing and other textile products—18 percent of these products were recovered for recycling or export in 2005.

Overall, *durable goods* were recovered at a rate of 18.5 percent in 2005. Nonferrous metals other than aluminum had one of the highest recovery rates, at 72.4 percent, due to the high rate of lead recovery from lead-acid batteries. Recovery of steel in all durable goods was 30.1 percent, with high rates of recovery from appliances and other miscellaneous durable goods.

One of the products with a very high recovery rate was lead-acid batteries, recovered at a rate of 98.8 percent in 2005. Other products with particularly high recovery rates were newspapers (88.9 percent), corrugated boxes (71.5 percent), major appliances (67.0 percent), steel packaging (63.3 percent), and aluminum cans (44.8 percent). About 35 percent of rubber tires were recovered for recycling. (Other tires were retreaded, and shredded rubber tires were made into tire-derived fuel.)

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[*] Standard mail was formerly called Third Class mail by the U.S. Postal Service.

RESIDENTIAL AND COMERCIAL SOURCES OF MSW

Sources of MSW, as characterized in this report, include both residential and commercial locations. We estimated residential waste (including waste from multi-family dwellings) to be 55 to 65 percent of total MSW generation. Commercial waste (including waste from schools, some industrial sites where packaging is generated, and businesses) constitutes between 35 and 45 percent of MSW. Local and regional factors, such as climate and level of commercial activity, contribute to these variations.

MANAGEMENT OF MSW

Overview

EPA's integrated waste management hierarchy includes the following four components, listed in order of preference:

- Source reduction (or waste prevention), including reuse of products and on-site (or backyard) composting of yard trimmings
- Recycling, including off-site (or community) composting
- Combustion with energy recovery
- Disposal through landfilling or combustion without energy recovery.

Although we encourage the use of strategies that emphasize the top of the hierarchy whenever possible, all four components remain important within an integrated waste management system.

Source Reduction

When we first established our waste management hierarchy, we emphasized the importance of *reducing* the amount of waste created, reusing whenever possible, and then recycling whatever is left. When municipal solid waste is reduced and reused, this is called “source reduction”—meaning the material never enters the waste stream.

Source reduction, also called waste prevention, includes the design, manufacture, purchase, or use of materials, such as products and packaging, to reduce their amount or toxicity before they enter the MSW management system. Examples of source reduction activities are:

- Designing products or packaging to reduce the quantity or the toxicity of the materials used or make them easy to reuse.
- Reusing existing products or packaging, such as refillable bottles, reusable pallets, and reconditioned barrels and drums.
- Lengthening the lives of products such as tires so fewer need to be produced and therefore fewer need to be disposed of.
- Using packaging that reduces the amount of damage or spoilage to the product.
- Managing nonproduct organic wastes (e.g., food scraps, yard trimmings) through onsite composting or other alternatives to disposal (e.g., leaving grass clippings on the lawn).

As the nation has begun to realize the value of its resources, both financial and material, efforts to reduce waste generation have increased.

Recycling

- Recycling (including community composting) recovered 32.1 percent (79 million tons) of MSW in 2005.
- There were about 8,550 curbside recycling programs in the United States in 2005.
- About 3,470 yard trimmings composting programs were reported in 2005.

Combustion with Energy Recovery

An estimated 33.4 million tons (13.6 percent) of MSW was combusted with energy recovery in 2005 (see Tables ES-1 and ES-2), slightly less than the 34.1 million tons estimated in 2004. Combustion with energy recovery increased from 2.7 million tons in 1980 to 29.7 million tons in 1990. Since 1990, the quantity of MSW combusted with energy recovery has increased slightly.

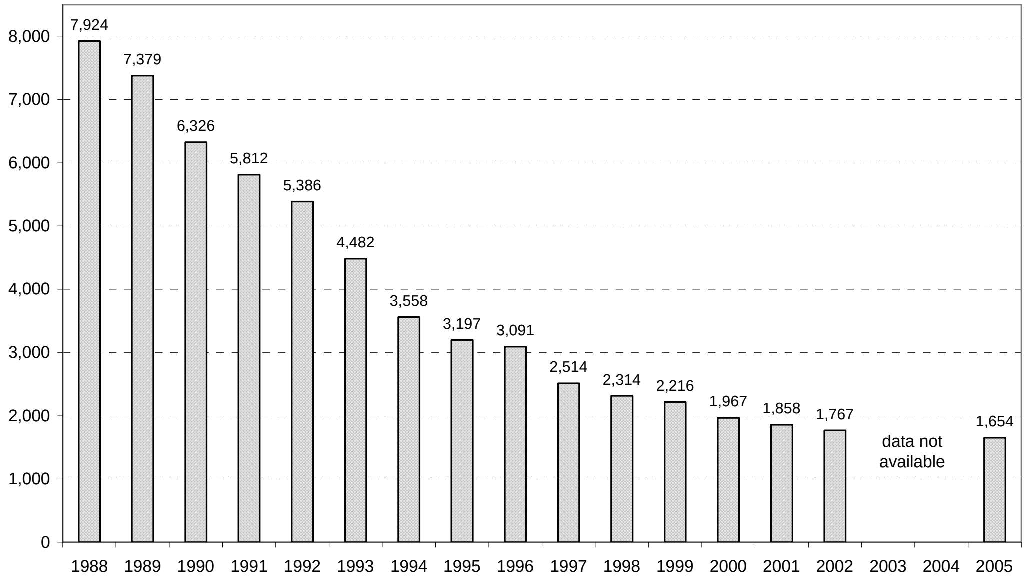
Disposal

During 2005, about 54.3 percent of MSW was landfilled, down somewhat from 54.8 percent in 2004. As shown in Figure ES-5, the number of MSW landfills decreased substantially over the past 18 years, from nearly 8,000 in 1988 to 1,654 in 2005—while average landfill size increased. At the national level, capacity does not appear to be a problem, although regional dislocations sometimes occur.

- The percentage of MSW landfilled decreased slightly from 2004 to 2005. Over the long term, the tonnage of MSW landfilled in 1990 was 142.3 million tons (see Table ES-1), but decreased to 134.8 million tons in 2000. The tonnage increased to 135.5 million tons in 2004, then declined to 133.3 in 2005. The tonnage landfilled results from an interaction among generation, recycling, and combustion with energy recovery, which do not necessarily rise and fall at the same time.

- The net per capita discard rate (after materials recovery and combustion with energy recovery) was 2.46 pounds per person per day, down from 3.12 pounds per person per day in 1990, down from the 2.62 pounds per person per day in 2000 (Table ES-3).

Figure ES-5: Number of Landfills in the United States, 1988-2005

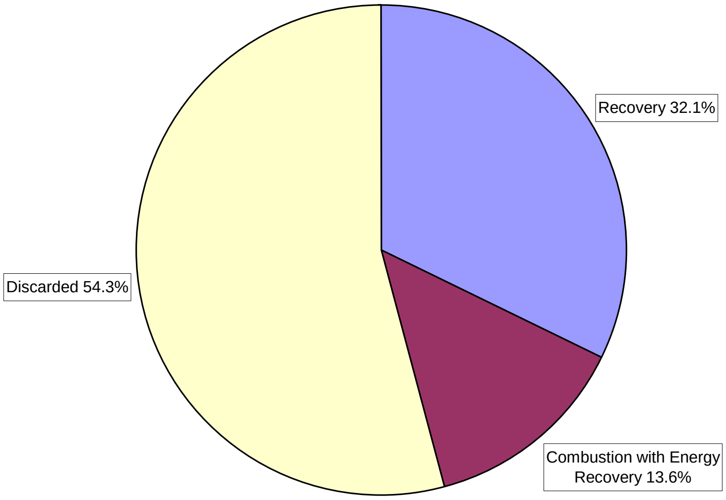


MSW recovered for recycling (including composting), combusted with energy recovery, and discarded in 2005 is shown in Figure ES-6. In 2005, 79.0 millions tons (32.1 percent) of MSW were recycled, 33.4 million tons (13.6 percent) were combusted with energy recovery, and 133.3 million tons (54.3 percent) were landfilled or otherwise disposed. (Relatively small amounts of this total undoubtedly were incinerated without energy recovery, littered, or illegally dumped rather than landfilled.)

FOR FURTHER INFORMATION

This report and related additional data are available on the Internet at www.epa.gov/osw.

Figure ES-6: Management of MSW in the United States, 2005



APPENDIX C

SOURCES AND FATE OF LEAD, CADMIUM AND MERCURY IN THE RESOURCE RECOVERY PROCESS

Sources and Fate of Lead, Cadmium, and Mercury in the Resource Recovery Process

FINAL REPORT

December 1994

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State University System of Florida
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Report #94-2

FINAL REPORT

July 1, 1990 - September 27, 1993

PROJECT TITLE: Sources and Fate of Lead, Cadmium, and Mercury in the Resource Recovery Process

PRINCIPAL INVESTIGATORS: Howell H. Heck, Ph.D., P.E.
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COMPLETION DATE: July 1. 1992 PHONE NUMBER: 407-768-8000 x7154

KEY WORDS Lead, Cadmium, Mercury, Sources, Fates, Resource Recovery, Solid Waste, Incineration

ABSTRACT

Brevard County, Florida, was selected as a typical site to determine waste. component distributions and metal concentrations in municipal solid waste (MSW).

The miscellaneous waste fraction contributed 28 percent to the overall lead input. Plastic bags contributed 24 percent of the lead. The measured lead content of the miscellaneous fraction was attributed to the presence of road dust, paint chips, and small metal particles that accumulate in this fraction. Lead was the most evenly distributed of the metals. The cadmium in MSW was attributed to the miscellaneous fraction, with approximately 91 percent due to the discard of household batteries. The primary source of cadmium in household batteries was rechargeable ni-cad batteries. Two percent of the cadmium in MSW resulted from the discard of plastic bottles. Most waste fractions contributed less than one percent of cadmium.

Tbe most significant source of mercury in MSW was discarded household batteries. Over 85 percent of mercury resulted from household batteries. Button-type and alkaline batteries contain high concentrations of mercury.

The analysis of specific consumer products did not indicate a single group of materials that had a significantly high concentration of any of these metals. Within each group, individual consumer products contained large amounts of a particular metal. Some manufactures were producing plastic packaging that contained concentrations three or four orders of magnitude greater than their competitors.

The reduction of cadmium and mercury in MSW will require the collection of household batteries and the use of nonmetal-based additives in plastic products. The control of lead will be much mote difficult because almost all materials contribute some lead to the. waste stream.

Lead, cadmium, and mercury behaved differently in the incineration process. Lead was concentrated in the bottom ash, cadmium in the collected fly ash, and mercury released. These differences were primarily due to the different boiling points of the elements and their compounds.

EXECUTIVE SUMMARY
FINAL REPORT

July 1,1990 - September 27, 1993

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PRINCIPAL INVESTIGATORS: Howell H. Heck, Ph.D., P.E.
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1. Objectives

The objectives of this research were to determine the levels of lead. cadmium, and mercury in specific consumer products, such as printed paper products, plastic containers, alkaline and rechargeable ni-cad batteries; to determine the concentrations of lead, cadmium., and mercury in MSW in a typical Florida waste management district; and to discuss the probable fate of these metals in the incineration process.

2. Rational

Ptevious research determined that lead, cadmium, and mercury are the principal toxic metals in resource recovery ash. If the sources of these metals were known, it may be possible to devise management control strategies to reduce their concentrations. The reduced metal concentrations would reduce me toxicity of both fly ash and atmospheric particulate, increase the likelihood of recycling this waste, and reduce the cost of disposal.

3. Methodology

The Brevard County landfill, in Cocoa, Florida, was the selected sampling location. Commercial trucks were sampled between August and September 1990. Single family trucks were sampled between August 1990 and October 1991. Compactor trucks discharged their contents in the receiving area of a shredder facility. A sub-sample was selected from one truck load (8 to 12 metric tons). This sub-sample was chosen by visual examination of the original pile and selecting a well-mixed representative portion weighing about 90-100 kg. This type of judgment sampling can be very effective, if conducted by a knowledgeable person familiar with solid waste sampling. At times it was necessary to delete a complete sorting when it becomes apparent that a non-representative sample has been selected. This method was developed to reduce the sampling requirements that otherwise would require many times tbe sampling effort to use classical statistical models applied to information obtained from random samples. The 90-100 kg sub-sample was sorted by hand into the mutually exclusive components reported in the results section. The sorted samples were then weighed and shredded to a size less than 10 mm in a garden-type shredder, collected, and transferred into polyethylene bags. The bags were brought to the laboratory and temporarily stored at -4°C. From these stored components, a sub-sample was collected for drying. The moisture content of each municipal solid waste component was determined at

104±l°C for lead and cadmium analysis, and at 60 ±l°C for mercury analysis in a temperature-controlled drying oven until constant weight (± 10 mg) was achieved The drying time was typically twenty four hours and the samples were cooled in a desiccator after drying. The sub-sample was prepared after drying by grinding to a particle size of less than 0.5 mm in a laboratory mill. Aluminum ferrous or non-ferrous metals, construction debris, batteries, and glass samples could not lx ground in the mill, and their particle size was reduced by crushing or shearing.

With the exception of aluminum, ferrous metal, non-ferrous metal, construction debris, batteries, and glass samples, digestion of the MSW components and consumer products for lead and cadmium analysis was by a modified form of ASTM method E926-88 (ASTM, 1989), which is used for preparing refuse-derived fuel for analysis of metals. The other material required use of different acids for complete digestion or heating the acids with reflux for extended periods of time-.

Calibration standards were prepared at the time of analysis. Three calibration standards were used to generate a calibration curve for each analysis, and the calibration procedure was performed every time an analysis was conducted. To provide a measme of analytical accuracy, National Institute of Standard and Technology (NIST) multielement solutions 3 171 and 3172 were analyzed for cadmium and lead, respectively, with each calibration. The samples or extracts were analyzed in duplicate. To prevent metals contamination, only Baker Instra-Analyzed trace metal grade acids were used in the digestion.

For mercury analysis, samples were digested according to EPA Method 747 1 (U.S. EPA, 1986). The sample was analyzed for the presence of mercury using the cold-vapor technique on a Flow Injection Atomic Spectrometer (FIAS) with the Perkiu-Elmer 5100 Atomic Absorption Spectrophotometer (AAS). To ensure analytical accuracy, NIST coal fly ash 1633, a standard reference material, was also digested and analyzed

The specific consumer products that were tested for lead, cadmium, and mercury were purchased and essentially the same size reduction, chemical digestion, and analytical procedures were used.

4. Results

4.1 Component Distributions

The Florida Department of Envirommental Protection has developed specific formats for counties to use in the annual recycling report. In an effort to make these results as useful as possible for the Florida solid waste districts, this report will adopt FDEP' s format. The short list, Table 1, consists of the same 17 components that FDEP uses. The long list, Table 2 consisting of 28 items, was more helpful in identifying specific components containing high concentrations of metals. Tbree categories of generators were sampled: single family, multi-family, and commercial. Because multi-family and commercial generators were collected using the same trucks and usually mixed within the same load, they were sampled as one source.

A comparison between single family and the combined multi-family and commercial waste stream analysis showed some differences. The differences were logical upon examination of the activities that occur at these establishments. Those components in the multi-family and commercial generator categories with significant percent decreases relative to the single-family category results included yard waste and textiles. Most apartment complexes and businesses use a lawn care service that transports the yard waste directly to the landfill and therefore is not present in the waste stream of these sources. People are more likely to generate textile waste from activities such as household cleaning, automobile maintenance and disposal of unwanted garments at home. The component that showed a significant increase over time single family composition was paper.

Table 1. Measured Component Distributions, Metal Concentrations, and Percent Distribution in Brevard County Waste: Short List

Solid Waste Distribution		Metal Concentrations			Metal Distribution Percent By Weight		
Components	Percent by Weight*	Pb** ppm	Cd** ppm	Hg** ppm	Pb	Cd	Hg
FOOD WASTE	10.2	1.37	0.06	0.22	1.38	0.19	1.49
YARD TRASH	16.1	3.39	0.1	0.24	5.38	0.50	2.57
CONSTRUCTION	9.50	4.75	0.38	0.24	4.47	1.13	1.52
OFFICE PAPER	2.33	3.63	0.04	0.23	0.84	0.03	0.36
NEWSPAPER	6.64	2.26	0.07	0.24	1.48	0.15	1.07
CORRUGATED	5.73	4.61	0.09	0.28	2.61	0.16	1.07
OTHER PAPER	15.3	2.37	0.07	0.21	3.58	0.34	2.14
TEXTILE	5.20	2.18	0.17	0.36	1.12	0.28	1.25
PLASTIC BOTTLES	2.32	18.5	3.06	0.27	4.24	2.23	0.42
OTHER PLASTICS	9.37	28.7	0.27	0.25	26.6	0.79	1.57
FERROUS	5.01	8.54	0.28	0.16	4.23	0.44	0.54
NON-FERROUS	0.17	52.7	8.48	0.17	0.89	0.45	0.02
ALUMINIUM	1.29	36.9	0.95	0.26	4.71	0.38	0.22
GLASS	4.61	22.8	0.14	0.09	10.4	0.20	0.28
MISCELLANEOUS***	6.36	44.6	46.4	20.1	28.1	92.7	85.5
TOTALS	100.0				100.0	100.0	100.0

*Values from Table 21 of the attached final report for combined single family, multi-family, and commercial waste.

** Mean values calculated from long list concentrations.
Concentration data reported in Appendix C of the attached final report.

*** Miscellaneous includes batteries.

Table 2. Measured Component Distributions, Metal Concentrations, and Metal Percent Distributions in Brevard County Waste: Long List

Solid Waste Distribution		Metal Concentrations			Metal Distribution Percent By Weight		
Components	Percent by Weight	Pb* ppm	Cd* ppm	Hg* ppm	Pb	Cd	Hg
FOOD WASTE	7.28	1.37	0.06	0.22	0.96	0.13	1.02
YARD TRASH	16.3	3.39	0.10	0.24	3.91	0.47	2.49
NEWSPAPER (NP)	5.63	1.72	0.07	0.24	0.94	0.12	0.86
(NP) COLORED	1.86	3.89	0.09	0.23	0.58	0.05	0.27
OFFICE PAPER	2.57	3.63	0.04	0.23	1.12	0.03	0.38
CORRUGATED	4.59	4.61	0.09	0.28	1.94	0.13	0.82
DIAPERS	2.67	2.97	0.06	0.24	0.65	0.04	0.41
OTHER PAPER	15.6	2.37	0.07	0.21	3.22	0.31	2.08
TEXTILE	4.73	2.18	0.17	0.36	0.89	0.24	1.08
PLASTIC BAGS	2.78	92.2	0.31	0.26	24.2	0.25	0.46
PET BOTTLES	0.32	1.07	0.02	0.22	0.03	0.00	0.04
PET LABELS	0.01	2.16**	0.09	0.31	0.00	0.00	0.00
PET CAPS	0.02	0.21	0.02	0.24	0.00	0.00	0.00
PET BOTTOMS	0.05	212	0.09	0.24	1.10	0.00	0.01
HDPE BOTTLES	0.44	1.11	0.09	0.23	0.02	0.01	0.06
HDPE LABELS	0.01	2.16**	0.08	0.23	0.00	0.00	0.00
HDPE CAPS	0.03	0.45	0.02	0.27	0.00	0.00	0.01
OTHER BOTTLES	1.54	18.1	0.10	0.30	2.16	0.05	0.29
OB LABELS	0.01	2.16**	0.29	0.23	0.00	0.00	0.00
OB CAPS	0.08	74.9	90.30	0.23	2.54	2.21	0.01
OTHER PLASTICS	4.07	21.7	0.38	0.24	7.35	0.45	0.62
FERROUS	6.33	8.27	0.28	0.16	4.36	0.53	0.64
NON-FERROUS	0.19	41.2	8.47	0.17	0.72	0.47	0.02
ALUMINIUM	1.23	36.9	0.95	0.26	3.99	0.35	0.20
GLASS	3.98	22.7	0.14	0.09	9.17	0.17	0.23
CONSTRUCTION	11.0	4.66	0.38	0.24	3.58	1.24	1.68
BATTERIES***	0.06	91.7	4870	2100	0.43	91.3	84.6
MISCELLANEOUS	6.67	45.0	0.15	0.39	26.2	1.40	1.66
TOTALS	100.0				100.00	100.00	100.00

*Mean values reported. Calculations presented in Appendix C of the attached final report.

**All plastic bottle label metal concentrations were statically analyzed as a single set.

***Metal concentrations were calculated based on a weight distribution estimated to be 90/9/1 alkaline to carbon-zinc to nickel-cadmium batteries. Metal concentrations were measured using purchased batteries not recovered batteries.

At the time of this report, curbside recycling was not occurring at most multi-family and commercial establishments; therefore newspaper was being deposited with the solid waste. Furthermore, commercial establishments produce larger quantities of corrugated paper and other paper, primarily from packaging. Much of this is disposed rather than recyclcd.

A comparison of the Brevard County waste stream and the State. of Florida (FDER, 1992) waste stream showed that the composition of waste landfilled or incinerated was very similar. Paper, glass, food waste, and yard waste distributions were almost identical. The numerical distributions were 30.0 and 3 1.1 percent, 4.6 and 4.6 percent, 10.2 and 8.2 percent, and 16.1 and 16.9 percent, respectively. The distribution of metals, plastics, textiles, and construction waste were close with numeric values of 6.5 and 4.5 percent, 11.7 and 7.8 percent, 5.2 and 3.6 percent, and 9.5 and 13.2 percent, respectfully. White goods and tire distributions were very different because they are usually collected separately. If white goods existed in the trucks being sorted they would have been eliminated. The is because the sample would not have been a representative sample; or if a truck load from a commercial tire dealer arrived when a truck was being selected, the truck load would have been eliminated for the same reason. Metal concentrations in most MSW streams could be calculated by substituting the appropriate component weight distribution into Tables 1 or 2, column one.

4.2 Metals in MSW

Table 1 shows that other plastics and the miscellaneous waste fraction contribute significantly to the overall lead input. The other plastic fraction contains diapers and all plastics except bottles. Diapers were included in the plastic fraction because it was believed that, as a metal source, the plastic lining would contain most of the metals. Of the plastic fraction, plastic bags contribute 24 percent of the lead (Table 2). A possible source of the lead could be the lead-based pigments. Although some bottle labels and the bottoms from PET beverage bottles show comparatively high lead contents, their influence on the total lead content of MSW is negligible due to the small weight fraction of these MSW components. There were measured concentrations within the plastic categories and non-ferrous metals that were orders of magnitude higher than the reported averages in Tables 1 and 2. These concentrations were eliminated from the calculated averages for statistical reasons; the measured concentrations were accurate but not statistically valid and indicated that the actual input could be higher. The measured lead content of the miscellaneous fraction can be attributed to the presence of road dust, paint chips, and small metal particles that can accumulate in tbis fraction and was not due to the presence of batteries that are reported in this fraction. Batteries contributed less than one percent of the total lead content. Many other components contribute significant amounts of lead. Yard waste, construction waste, other paper, plastic bottles, ferrous metals, aluminum, and glass each contribute between three and ten percent of the lead present. The multitude of sources containing significant amounts of lead will hamper any control strategies.

Table 1 shows that plastic bottles and the miscellaneous waste fraction were the main sources of cadmium. The cadmium in MSW attributable to the miscellaneous fraction was almost exclusively due to the discard of rechargeable ni-cad batteries, which represented 91 percent of the cadmium (Table 2). If this source were controlled, then a significant reduction in cadmium would be realized. The plastic bottles category was composed of PET and HDPE drink containers and other plastic bottles that are used as containers for a variety of products. Among these sources, plastic bottle caps from other plastic bottles contributed almost all of the cadmium. The contribution was 2.2 percent of the total cadmium. Measured concentrations within the plastic categories were eliminated from the calculated averages for statistical reasons: these measured concentrations were accurate and indicate. that the actual average could be higher. The miscellaneous and construction waste fractions contributed approximately one percent each, and all other sources were less than one percent.

Table 1 reports that the most significant source of mercury in MSW was discarded batteries, with 85 percent of the mercury in MSW resulting from mainly button-type and alkaline batteries. Other contributors were yard waste and other paper at two to three percent levels. All other components contributed less than two percent each. Most of the mercury concentrations measured were close to the detection limit. The detection limit varied slightly depending on interferences and sensitivity but was usually 0.1 ppm. This is the detection limit reported by most certified laboratories and represents current state of the art methodologies. Concentrations between 0.1 and 0.2 ppm are measurable and reportable, but they are not as reproducible as concentrations above 0.25 ppm. The calculated means included all measured concentrations except those eliminated by statistical analysis. The measurable content of mercury could almost be eliminated by eliminating batteries in the waste stream.

4.3 Metals in Specific Consumer Products

In general, analysis of the specific consumer products did not indicate a single group of materials that had a significantly high concentration of any of the metals. Within each group individual consumer products contained large amounts of a particular metal. The manufacturers of these unique products were contacted to determine the source of the metal in that product. Several of the manufacturers were unwilling to provide the requested information. Those companies that did respond indicated that. although their product may have contained heavy metals in the past, the current manufacturing processes use organic or non-toxic (rather than metal-based) chemicals as a result of state regulations that limit the toxicity of packaging materials. This was not true in all cases. At least one manufacturer had recently switched to additives that greatly increased the metal content. Other manufacturers were producing packaging that contained concentrations three or four orders of magnitude above their competitors. These manufacturers were all using some type of plastic bottle container. Any regulation regarding metal content would need to address this group specifically.

4.4 Fate of Metals During Incineration

Every metric ton of dry MSW incinerated generates about 295 kg of bottom ash, 23 kg of fly ash, and about 0.5 kg of atmospheric particulates (Korzun and Heck, 1990). The fate of these metals during the incineration process is unknown on a component bases. Lead, cadmium, and mercury will behave differently due to their different physical and chemical characteristics. Because lead and lead compounds have a lower vapor pressure than cadmium and mercury and their compounds, lead is more likely to be retained in tbe bottom ash and therefore less concentrated in the electrostatic precipitator (ESP) dust. The partitioning of lead in the resource recovery process is reported to be 5 percent in the flue gas, 37 percent in the electric precipitator dust, and 58 percent in the bottom ash (Brunner and Monch, 1986).

Cadmium, due to its high vapor pressure, is assumed to enter the gas phase during incineration. During cooling of the off-gas, cadmium condenses and deposits on the fly-aab particles and can be collected by an electrostatic precipitator (Brunner and Monch, 1986). The temperature, retention time, and air supply on the incineration grate and combustion chamber can greatly influence the distribution of metals with high vapor pressures so that a greater fraction is transferred into the fly ash Brunner, 1989). The volatility of cadmium can be assessed by plotting the vapor pressures of cadmium and cadmium compounds that are likely to be present during the incineration process. Although the exact chemical speciation is not known in quantitative terms, a large portion of me cadmium can be estimated to be present as $CdCl_2$. This compound and elemental cadmium have high vapor pressures at temperatures encountered during combustion (800-1000°C), and will even reach 1 atm (boiling) for metallic elemental cadmium and cadmium chloride. Vogg et al. (1986) reported that in the process of incineration, cadmium is volatilized as cadmium chloride to a large extent. In a series of m-situ measurements performed at a large-scale incineration plant, 99 percent of this cadmium condenses on dust particles. The experiments on one selected incinerator showed that about 30 percent of the cadmium content remained in the slag and 70 percent occurred in the off-gas, from that 65 percent went into the filter ash and 5 percent into the clean flue gas. Cadmium can therefore be assumed to be either removed with the fly-ash particles it condenses on, or to leave the resource recovery process with the particles in the dust emission. i.e., flue dust. A quantitative estimate of this partitioning is reported to be 12 percent for flue gas, 76 percent for ESP dust, and only 12 percent for bottom ash or slag (Vogg et al., 1986).

Mercury is a very volatile metal with low melting (-38.87°C) and boiling points (356.58°C). Due to its high volatility, the distribution of mercury in the resource recovery process is 72 percent in the flue gas, 24 percent in the ESP dust (fly-ash), and 4 percent in the bottom ash (Brunner and Monch, 1986). Vogg et al. (1986) reported, based on boiler outlet measurements at large-scale incinerators, tbat at temperatures between 200°C and 230°C about 80 Percent of all mercury is released into the gas phase and about 20 percent deposited on fly ash The, concentrations of mercury in bottom ash have been reported to be very low except in those rare cases of insufficient incineration (Reimann, 1986). According to Reimann, concentrations of mercury found in furnace and filter dust ate also low. Organic mercury compounds can be expected only in extremely low concentrations, if at all, in the resource recovery process. These compounds are reportedly unstable and decompose generally at 300-100°C (Reimann, 1986).

5. Conclusion

Currently, household batteries are the single most significant source of mercury (85 percent) and cadmium (9l percent) in the post-recycled MSW stream. Control of batteries could reduce the mass of mercury present by at least one order of magnitude and at the same time reduce the cadmium content an order of magnitude. Due to the small volume of batteries present in the waste stream, it should be possible to control their disposal by adoption of either a significant deposit with commercial recycling or an aggressive household recycling program. Current trends to reduce the metal content of batteries will have only minimal effects on reducing the waste stream content. Markets are now developing for spent batteries to recover their metal contents; this would provide a market for batteries collected

The plastic container industry is a significant source of cadmium and lead. They are found in high concentrations in only a few plastic products and are not a necessary additive. It may be easier to manage this source of cadmium and lead by limiting the content of these metals in consumer products. At this time, many states have adopted laws regulating heavy metal content in consumer products.

The control of lead will be the most difficult due to its presence in most waste components. The glass and metal fractions contain 20 percent. The increased recycling of glass and metal containers will help eliminate this source of lead. Pm- or post-incineration processing may also separate these metals from the ash streams. Significant amounts of lead will still remain in the waste stream until substitute materials are developed

APPENDIX D

LIST OF GOVERNMENT RECIPIENTS OF THE ILLINOIS EPA PA-16 NOTIFICATION FORM

Compliance with 35 Ill. Admin. Code 807.205 (k). List of people notified. Notifications sent to the City Clerk of each municipality, any portion of which is within 3 miles of the project site boundary and each member of the general assembly from the legislature district in which the site is located.

ILLINOIS EPA PA-16 FORM ATTACHMENTS

The following is a list of the required recipients of the attached Illinois EPA PA-16 Form for the proposed Illinois Recycling and Renewable Fuels project. Verifications of shipment receipts for each recipient are also attached.

LIST OF GOVERNMENT RECIPIENTS OF THE ILLINOIS EPA PA-16 NOTIFICATION FORM FOR THE INDIANA RECYCLING AND RENEWABLE FUELS, LLC dba ILLINOIS RECYCLING RENEWABLE FUELS, LLC CHICAGO HEIGHTS PROJECT

GOVERNMENT OFFICE	RECIPIENT	MAILING ADDRESS	PHONE
Cook County State's Attorney	Anita Alvarez	69 W. Washington, Suite 3200 Chicago, IL 60602	312-603-1880
Chairman of the Cook County Board	Todd Stroger	118 N. Clark St., Room 537 Chicago, IL 60602	312-603-6400
Members of the Illinois General Assembly for Project Legislative District:	State Representative Anthony DeLuca	722 W. Exchange, Suite 4 Crete, IL 60417	708-672-0200
	State Senator Toi W. Hutchinson	241 W. Joe Orr Road Chicago Heights, IL 60411	708-756-0882
Clerk of each municipality, any portion of which is within 3 miles of the Project boundary:			
Chicago Heights	Ethel M. Taylor	1601 Chicago Road Chicago Heights, IL 60411	708-756-5317
South Chicago Heights	Melinda Villarreal	3317 Chicago Road South Chicago Heights, IL 60411-5422	708-755-1880
Steger	Carmen Recupito	35 W. 34th Street Steger, IL 60475-1105	708-754-3395
Sauk Village	Debbie Williams	21701 Torrence Ave Sauk Village, IL 60411-4561	708-758-3330
Glenwood	Carmen Hopkins	One Asselborn Way Glenwood, IL 60425	708-753-2400
Olympia Fields	Judi Rangel	20040 Governors Hwy Olympia Fields, IL 60461	708-503-8000
Lynwood	Ray Valle	21460 Lincoln Hwy Lynwood, IL 60411-8742	708-758-6101
Homewood	Gayle Campbell	2020 Chestnut Road Homewood, IL 60430-1702	708-798-3000
Ford Heights	Gloria Bryant	1343 Ellis Ave. Ford Heights, IL 60411-3012	708-758-3131
Park Forest	Sheila McGann	350 Victory Drive Park Forest, IL 60466-2003	708-748-1112
Crete	Deborah S. Bachert	524 W. Exchange Street Crete, IL 60417-2139	708-672-5431

Illinois Recycling and Renewable Fuels, LLC.

Cordially invites you to attend our

Presentation Meeting
For
A new Biomass Derived Fuel Manufacturing Facility
Chicago Heights, Illinois

Guest Speakers:

Jim Ventura
M. L. Smith, P. E.
Dr. Fred L. Jones

Monday, November 9th, 2009 at 10:00 a.m.

Chicago Southland Chamber of Commerce
1916 West 174th Street
East Hazel Crest, Illinois 60429

Learn how this $121 million investment in the Chicago Southland will provide jobs, environmental solutions and help reduce our dependence on foreign fuels.

Please reply by November 5th to 708-758-0875

MAILED TO RECIPIENTS ON EPA PA-16
FORM

APPENDIX E

FUGITIVE ROAD DUST PM AND PM10 EMISSION FACTOR DETERMINATIONS

EMISSION FACTOR DETERMINATION

PM-Transfer Trailers

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	4
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	20
Total roadway length in miles:	0.5
Number of vehicles per day:	40
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$E = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.082 lbs/VMT
sL = 0.4 g/m2
W = 20 tons
E = 0.4958 lbs/VMT TSP

EMISSION FACTOR DETERMINATION

PM10-Transfer Trailers

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	2
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	20
Total roadway length in miles:	0.5
Number of vehicles per day:	40
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	■
2	Worst-case	0.5	■
3	Normal	■	0.4
4	Worst-case	■	3

[a]Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.016 lbs/VMT
sL = 0.4 g/m2
W = 20 tons
E = 0.0968 lbs/VMT PM-10

EMISSION FACTOR DETERMINATION

PM-Packer Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	4
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	15
Total roadway length in miles:	0.5
Number of vehicles per day:	110
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.082 lbs/VMT
sL = 0.4 g/m2
W = 15 tons
E = 0.3221 lbs/VMT TSP

EMISSION FACTOR DETERMINATION
PM10-Packer Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	2
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	15
Total roadway length in miles:	0.5
Number of vehicles per day:	110
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$E = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.016 lbs/VMT
sL = 0.4 g/m2
W = 15 tons
E = 0.0628 lbs/VMT PM-10

EMISSION FACTOR DETERMINATION

PM-Recylce & Residue Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	4
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	20
Total roadway length in miles:	0.5
Number of vehicles per day:	50
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)

k = base emission factor for particle size range and units of interest

sL = road surface silt loading (grams per square meter) (g/m2)

W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.082 lbs/VMT

sL = 0.4 g/m2

W = 20 tons

E = 0.4958 lbs/VMT TSP

EMISSION FACTOR DETERMINATION
PM10-Recycle & Residue Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	2
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	20
Total roadway length in miles:	0.5
Number of vehicles per day:	50
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$E = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.016 lbs/VMT
sL = 0.4 g/m2
W = 20 tons
E = 0.0968 lbs/VMT PM-10

EMISSION FACTOR DETERMINATION

PM-Passanger Vehicles

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	4
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	2
Total roadway length in miles:	0.5
Number of vehicles per day:	100
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$E = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.082 lbs/VMT
sL = 0.4 g/m2
W = 2 tons
E = 0.0157 lbs/VMT TSP

EMISSION FACTOR DETERMINATION

PM10-Passanger Vehicles

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	2
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	2
Total roadway length in miles:	0.5
Number of vehicles per day:	100
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.016 lbs/VMT
sL = 0.4 g/m2
W = 2 tons
E = 0.0031 lbs/VMT PM-10

EMISSION FACTOR DETERMINATION
PM-Onsite Hauling Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	4
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	12.5
Total roadway length in miles:	0.5
Number of vehicles per day:	50
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.082 lbs/VMT
sL = 0.4 g/m2
W = 12.5 tons
E = 0.2450 lbs/VMT TSP

EMISSION FACTOR DETERMINATION

PM10-Onsite Hauling Trucks

Predictive Emission Factors for Paved Roads

	Data Entry Section
Source Name:	
Particle size option from Table 1:	2
Road surface silt loading option from Table 2:	3
Average weight of the vehicles traveling the road in tons (user supplied value):	12.5
Total roadway length in miles:	0.5
Number of vehicles per day:	50
Days per period:	365

Table 1: Multiplier

Option	Size Range	lb/VMT
1	PM-2.5	0.004
2	PM-10	0.016
3	PM-15	0.020
4	TSP	0.082

Table 2: Silt Loading Factors[a]

Option	Conditions	>5,000 Vehicles/day	<5,000 Vehicles/day
1	Normal	0.1	
2	Worst-case	0.5	
3	Normal		0.4
4	Worst-case		3

[a] Assumes same type road as public paved road.

Equation

The quantity of dust emissions from vehicle traffic on a paved road is estimated using the equation:

$$\mathrm{E} = k\,(sL/2)^{0.65}\,(W/3)^{1.5}$$

Where:

E = Particulate emission factor (having units matching the units of k)
k = base emission factor for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m2)
W = average weight (tons) of the vehicles traveling the road

Calculated Emission Factor

k = 0.016 lbs/VMT
sL = 0.4 g/m2
W = 12.5 tons
E = 0.0478 lbs/VMT PM-10