G O A L S O F P S D

- To ensure economic growth will occur in harmony with the preservation of existing clean air resources.

- To minimize (within the limits of BACT) any adverse effects on public health and welfare which might occur at new construction sites in attainment areas.

- To preserve, protect, and enhance the air quality in areas of special natural recreational, scenic, or historic value, such as national parks, and wilderness areas.

B A S I C R E Q U I R E M E N T S O F P S D

° PSD Applicability - New and Modified Sources

- > 100 tons/yr (after controls) - if one of 28 categories
- > 250 tons/yr (after controls) - any source

° Ambient Monitoring

- 1 year of ambient air monitoring in area of proposed plant
- Or use of representative air quality data in area

° Increment Consumption

- Total suspended particulate (TSP)
- Sulfur Dioxide (SO_2)

° Air Quality Analysis

- Use of air dispersion models
- Do not cause a violation of the NAAQS

° Best Available Control Technology (BACT)

- Means an emissions limitation
- Maximum degree of reduction
- Determined on a case-by-case basis taking into account
  - °° Energy
  - °° Environmental
  - °° Economic impacts and other costs

North County, California Resource Recovery PSD Remand

- Impact on BACT Determinations

  - May consider environmental impact from unregulated pollutants (i.e., dioxins, furans, etc.) in determining BACT limits for regulated pollutants

  - May require a more strigent BACT limit for a regulated pollutant to control hazardous unregulated pollutants

  - In determining whether the cost for additional controls are reasonable, EPA looks at the incremental control cost differential for removing an additional ton of pollution

    For example, controlling SO_2 emissions with a dry scrubber will not only control SO_2 emissions, but will control HCl, dioxins, furans, mercury (gas), lead (gas), HF, and other acid gases

RESOLUTION

Introduced 1.27.87

	YEA	NAY
Commissioner Nixon	☑	☐
Commissioner Trachtenberg	☑	☐
Commissioner Veale	☑	☐
Vice Mayor Budd	☑	☐
Mayor Robb	☑	☐

RESOLUTION NO. C1987/5

A RESOLUTION OF THE CITY COMMISSION OF THE CITY OF DEERFIELD BEACH, BROWARD COUNTY, FLORIDA URGING THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AND BROWARD COUNTY, FLORIDA TO REQUIRE STATE OF THE ART AIR POLLUTION EMISSION CONTROLS BE INSTALLED AT THE PROPOSED NORTH BROWARD RESOURCE RECOVERY FACILITY; PROVIDING FOR AN EFFECTIVE DATE

WHEREAS, Broward County, Florida, has applied to the State of Florida Department of Environmental Regulation and will be applying to the United States Environmental Protective Agency for the necessary permits to construct and operate Broward County's proposed North Broward Resource Recovery Facility; and

WHEREAS, in a letter dated October 9, 1986, attached hereto as Exhibit A, the United States Environmental Protection Agency established a best available control technology standard for two similar nearby facilities which require 90% acid gas control and a 0.015 gr/dscf particulate emission limitation; and

WHEREAS, the United States Environmental Protection Agency's best available control technology determination provides a greater measure of security and protection for the health, safety and welfare of the citizens of Broward County than the control technology proposed by Broward County; and

WHEREAS, the citizens of Broward County have demonstrated overwhelming support for the state of the art control technology as set forth by the United States Environmental Protection Agency in its letter dated October 9, 1986,

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COMMISSION OF THE CITY OF DEERFIELD BEACH, AS FOLLOWS:

Section 1: That the City of Deerfield Beach strongly urges the United States Environmental Protection Agency to require Broward County to install at the proposed North Broward Resource Recovery Facility the control technology set forth in its letter of October 9, 1986, and further, strongly urges Broward County to agree voluntarily to install the necessary control technology at its proposed North Broward Resource Recovery Facility.

Section 2: A certified copy of this Resolution shall be forwarded to the United States Environmental Protection Agency and to the Broward County Board of County Commissioners.

Section 3: This Resolution shall take effect immediately upon its adoption.

ADOPTED THIS 27TH DAY OF JANUARY, 1987.

Jean M. Robb
Mayor

ATTEST:

Muriel W. Ficken
City Clerk

BEST AVAILABLE COPY

R. Mastronardi

PETITION

To: JACK RAVAN
Administrator Region IV
United States Environmental Protection Agency
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Re: BACT determination for North Broward Resource Recovery Project, Inc., Broward County, Florida

We, the undersigned, hereby request and urge the United States Environmental Protection Agency to require the implementation of BACT (Best Available Control Technology) at the North Broward Resource Recovery Project located in Broward County, Florida by installing scrubbers and baghouse filters. We acknowledge that additional costs may be associated with the state of the art equipment necessary to maintain BACT. However, the health, safety and welfare of the residents of those areas impacted by the project is of paramount importance and outweighs said costs.

NAME	ADDRESS
Faye Cilibraise	3699 N.W. 35th St. CC
Mary Salomone	2452 Epsca Ave Coconut C.
Harry Salomone	2452 Epsa Ave Coconut
Anthony Salomone	2636 Nahoon Ave Coco
Mary J. Santangelo	6047 Coral Lake D. Margate
Annie Magliano	3957 CARAMBOLA CIR. N. C.C.
Lucille Ayr	4106 Carambola Cir S. C.C.
Jacqueline R. Halligan	2676 Carambola Circle N. CC
Ruth R. Halligan	2676 Carambola Circle N CC
JOHN F. Halligan	2676 Carambola Circle N CC
Rita L Drouillard	6419 Coral Lake Dr. Margate
Edmund J Drouillard	6419 Coral Lake Dr. Margate
Shari Ceraneata	5546 E Lakewood Cir Margate
Robert Ceraneate	5546 E Lakewood Cir Margate
Ann Schnader	4091 NW 5 St. C. Coral
J Murphy	3953 Carambola Cir No.
J. Santangelo	6047 Coral Lake Dr. Mgte
Anthony Impraso	2604 Nassau Bend
David L. Vurch	4105 NW. 22ND St Coconut Creek
Lucille Orzetti	3827 N.W. 35th St.
Victor Orzetti	3827 N.W. 35th
Raya Morrison	5575 N. Lakewood Cir Marga
Andrea Kata	890 NW 48th AVE. CC
Michelle K MacDonald	690 NW 48 ave Coc Cr
Jacqueline Galinson	5933 Coral Lake Dr Margate FL
Jon Wilson	11152 Royal Palm Blvd C.S.

C O N C L U S I O N S

- Acid gas controls are available for RRF's and are proving to be effective in controlling SO_2, dioxins, furans, HCl, and other acid gases.

- The incremental control cost differential per ton of acid gas removed appears to be reasonable with respect to the environmental benefits of controlling nonregulated hazardous air pollutants.

- Local municipalities and citizen groups are in favor of state-of-the-art emission control and appear to be willing to pay the additional cost of the installation and operation of these acid gas controls.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

July 30, 1986

Mr. Joseph M. Koppel
President
Condominium Owners Association of
Century Village East, Inc.
1023 East Hillsboro Boulevard
Deerfield Beach, Florida 33441

Dear Mr. Koppel:

Secretary Tschinkel asked me to respond to your letter and resolution concerning the environmental safeguards for the design and construction of the North Broward Resource Recovery Facility (NBRRF). This department is charged with the permitting and regulation of the proposed facility. We will certainly consider the content and intent of our resolution to the Broward County Commission in making our decisions about the NBRRF.

The department's regulations as incorporated in Florida Administrative Code Chapter 17-5 requires a determination of Best Available Control Technology (BACT) for each new source of air pollution capable of emitting 100 tons per year of any pollutant regulated under the Clean Air Act. The NBRRF qualifies as a major new source of air pollution subject to the Act and our requirements.

The BACT regulations are found in Section 17-2.630, Florida Administrative Code. They require DER in making a BACT determination to consider EPA's BACT determinations, scientific, engineering and technical material, emission limiting standards

or BACT determinations of any state, and the social and economic impact of the application of such technology. This last consideration requires DER to consider costs and public concerns in making its determination.

The DER will recommend that Broward County use the Best Available Control Technology possible under the constraints of the regulations.

Thank you for sharing your concerns and providing the technical paper and news articles. They will be useful in making our decisions. Your support for maintaining Florida's clean air is appreciated.

Sincerely,

Mary F. Smallwood

Mary F. Smallwood, Director
Division of Environmental
Permitting

MFS/bos
cc: Steve Smallwood
Clair Fancy

Condominium Owners Organization of Century Village East, Inc.

RECEIVED
JUL 28 1986
Office of the Secretary

July 24, 1986

Ms. Victoria J. Tschinkel
DEPARTMENT OF ENVIRONMENTAL REGULATION
2600 Blair Stone Road
Tallahassee, Florida 32301-8241

Dear Ms. Tschinkel;

The Board of Directors of the Condominium Owners Organization of Century Village East, Inc. has unanimously passed a Resolution requiring the Broward County Commission to insist on the placing of safeguards in the construction and design of a propose refuse burning plant. The proposed site for the building of this plant will take place on Powerline Road, north of Sample Road in Broward County. This Resolution, together with with a copy of my covering letter to the Broward County Commissioners is enclosed. I am also enclosing several articles and reports that were prepared and published by competent engineers with extensive experience in the construction and maintenance of this type of building.

We are sending these enclosures to you in the hope that you might initiate similar action, or be instrumental in circulating a petition to be presented to the Broward County Commission.

We are sure you will be convinced, after reading the enclosures, that strong and drastic measures must be taken to protect the citizens of Broward County from the obvious dangers of constructing an incinerator with few if any safeguards.

Your reply to this letter, and your cooperation in this matter, will be greatly appreciated.

Very truly yours,

CONDOMINIUM OWNERS ORGANIZATION
OF CENTURY VILLAGE EAST, INC.

Joseph M. Koppel

Joseph M. Koppel, President

JMK:JB

Enclosures

1023 East Hillsboro Boulevard, Deerfield Beach, FL 33441 • Phone 421-5566

An Overview of The Burning Issues of Municipal and Hospital Waste Incineration.

by Jack D., Lauber PE,DAEE

Presented at the University of Florida, Gainesville Florida, March 1,1986,at "There is no Away"; Interdisciplinary Conference on Strategies for the Comprehensive Management of Domestic, Municipal,and Hazardous Wastes.

The opinions expressed in this paper are those of the author and not necessarily those of the N.Y.S.DEC

Introduction and Overview

We are now faced with a crisis in disposing of our municipal wastes; we generate about 150 million tons of garbage each year, and bury most of it in landfills. Our landfills are becoming toxic time bombs, often poisoning our precious ground waters.

Waste incineration previously was used by many municipalities, but older, polluting incinerators were generally eliminated over a decade ago, because many were violating air pollution control regulations.

Many municipal consultants are now recommending MSW incineration resource recovery systems that also recover substantial energy; much of this technology is based on European experience, which initially used electrostatic precipitators to only control particulate emissions.

Recent studies have indicated that MSW incinerators only equipped with ESP's can emit significant quantities of acid gases, and toxic air contaminants such as heavy metals, dioxins and furans.

Some environmentalists do not believe that MSW incineration ever can be made safe and advocate waste recycling as an alternate. However, only a small fraction of our wastes can now be effectively, and economically recycled; plastic wastes, especially PVC types, cannot be realistically separated and recycled; and yet they may pose serious emission problems if improperly burned.

Proper, high combustion efficiency incineration can minimize trace organic emissions, such as dioxins; acid gas controls can also condense and remove dioxins and furans; and heavy metals, as proven in recent European tests. Thus BACT, best available control technology, that can meet California, and European state of the art air pollution control standards, can make MSW incineration a safe and effective waste disposal strategy.

What are Municipal Wastes Composed of?

We live in a complex society , therefore our wastes are heterogeneous mixtures of many things, food wastes, paper, metals, and complex plastic resins of many types, including PVC plastics, that contain chlorine . Waste batteries and electrical components can add heavy metals, ie; cadmium, lead, mercury, etc. and even PCB's to MSW . Discarded household cleaners, pharmaceutical products, garden chemicals, and pesticides, further add hazardous components to our wastes. Photographic product wastes,also contain complex chemicals and toxic metals.

Studies of municipal waste sources have revealed that a large fraction of hazardous components in MSW come from domestic sources. Although there are prohibitions against disposing hazardous industrial and hospital wastes with MSW, this routinely occurs, and is difficult to enforce against.

Can We Effectively Recycle Our Municipal Wastes?

Waste recycling is an admirable goal, and we should encourage as much recycling as possible. However there are certain technological, and economic limitations to the recycling of MSW components.The Institute for Local Self Reliance of Washington D.C. studied waste recycling for the city of Philadelphia Pa. and estimated that about one third of this city's MSW could be recycled by various processes; however they also recommended that a refuse derived fuel be produced which could be burned in dedicated boilers, equipped with proper BACT air pollution controls.1

The most practical form of MSW recycling that now exists is precombustion separation of glass, metals, etc. which is practiced at Nashville and Gallatin Tenn. MSW disposal facilities; and is being planned for a New Haven Ct. MSW incineration project.2

Can Plastic Wastes be Recycled?

Some environmentalists advocate the recycling of plastics in MSW, to lessen the hazards of MSW incineration; by allegedly removing major sources of chlorine in MSW. Certain waste recycling processes exist in Europe that can separate and recycle light plastic film type materials, such as polyethylene and saran type plastic wastes. However because PVC plastic components are so heterogeneous and vary in molecular weight considerably, they cannot be practically separated from MSW; in addition, leading polymer experts have said that there are no prospects for being able to recycle most PVC in municipal wastes, because of it s thermosetting physical properties.3 Thus limited waste recycling and proper MSW or RDF incineration appear to be the most effective current MSW disposal alternatives.

What factors influence the Proper Combustion of Wastes?

Combustion has been known since our ancestors discovered fire; time, temperature and turbulence, the three T's of combustion , are the prime factors governing how well a fuel or waste can be burned. This may appear simple, but we still do not fully understand all the complex chemical reactions that can occur in fire. However there is much practical knowledge about the proper burning of various wastes, and the destruction of waste components.

The primary objective of waste incineration is to provide suitable oxygen and temperature to convert the combustible components into carbon dioxide and water vapor.

It is generally accepted in the scientific community that 1000 C or 1800F is a sufficiently high temperature to achieve 99.99% or greater destruction of the most difficult chlorinated compounds such as PCB's; dioxins , and furans, if

sufficient oxygen is supplied and mixed properly with the combustible materials.4

The best proof of combustion effectiveness available today is the measurement of carbon monoxide (CO) emissions; which only has recently been applied to MSW incineration4. However, while there appears to be a general trend of low hydrocarbon and trace toxic emissions, such as dioxins, with low carbon monoxide emissions and high combustion efficiency; no exact relationship between these parameters appears to exist; because there are other more complex factors, that are not well understood. However authorities have generally concluded that high combustion efficiency operation(about 100 ppm CO) of MSW incinerators will minimize the emission of dioxins and other trace toxic organics, similar to the destruction of PCB's in hazardous waste incinerators and high efficiency boilers.5

Though combustion controls can prevent formation of excessive amounts of gaseous carbon monoxide and hydrocarbons, maintaining sufficient temperatures and oxygen and mixing conditions will probably not destroy all the dioxins, since absolute control over furnace conditions at all times is not yet demonstrated.6

An Overview of Waste Incineration Air Contaminants

Particulates

Particulates that can be emitted from MSW and other types of incinerators are small solid particles or aerosols that can range in size from less than one micrometer (micron) to hundreds of microns; consiting of carbon, silica, alumina, sulfates ,etc. combined with heavy metals, acids, trace organics , and other pollutants6.

Particulates have been shown to be harmful to human health;especially the ultra fine ,submicron particles, which often contain adsorbed toxic substances, such as heavy metals and organics.These very fine particles can reach the alveoli of our lungs, and are believed to be responsible for chronic health effects.6

The control of submicron particles is a very important aspect of waste incineration, because MSW incinerators typically generate particulates in two general size ranges,0.5 and 5 microns.4 It is generally recognized that ESP's have a window where control efficiency for 0.5 micron particles can drop considerably, about 5% or more, compared to fabric filters whose control efficiency is generally greater than 99% for sub micron particles.4,6.

Acid Gases

Acid gases are generated primarily from sulfur and chlorine in wastes; there are also other types of acids that can be formed in MSW, but they are minor compared to the primary sulfur and chlorine containing acid gases, where sulfur dioxide can be converted to sulfuric acid, and

chlorine in waste forms hydrochloric acid, HCl.

There are three main concerns about acid gas emissions;localized acid gas corrosive and health effects, contribution to regional acid rain problems, and enhancement of the toxic effects of heavy metals.

Hydrochloric acid is very corrosive ,and in some cases HCl emissions from MSW incinerators have caused direct localized corrosive effects, as in the case of the Northwest Philadelphia incinerator where the emissions have allegedly impacted on a nearby electrical transmission line, causing severe corrosion.4 There is also documentation of similar acid attack on buildings in Europe4. HCL can also cause irritation to the eyes, and the respiratory system; and additional health effects from the inhalation of fine particles laden with such acids which are capable of lodging deep in the lungs6.

We are familiar with the problems of acid rain, which are generally caused by sulfuric and nitric acids, which form from power plant and automotive emissions; however HCL, while not emitted in as large quantities as SO2, is a much stronger acid; and highly corrosive HCl acid gas mists having 18-20% HCl content and a pH of 2, can form from MSW incinerator emissions.6.The State of New Jersey engaged a USEPA consultant to study this problem; they concluded that MSW incinerators may become major contributors to ambient acid gas levels, and recommended BACT controls to minimize the contribution of MSW incinerators to this regional acid rain problem, and to protect the general population from the localized effects of these gaseous emissions.5.

Toxicologists know that heavy metals, while toxic by themselves, are far more toxic in the presence of acid gases, since they become more soluble in body fluids. Thus the combination of Acid gases and heavy metals can result in enhanced synergistic health effects that are not well known.

With the levels of plastics in our waste streams increasing, many communities are approaching potential acid gas emission factors of about 10 lbs.of HCl per ton of waste, similar to European and Japanese waste levels.5. USEPA RCRA Hazardous waste regulations require that HCl be controlled by 99% or to 4 lbs.per hour; yet typical MSW incinerators can have as much as 50 times the HCl emissions than hazardous waste incinerators, and are uncontrolled in many cases; for example,a large 1500 ton per day MSW incinerator could emit more than 600 lbs.per hour of HCl acid gas emissions. Consequently there are many good reasons to require BACT acid gas controls for MSW incinerators.

Dioxins and Heavy Metal emissions

Polychlorinated dioxins and furans are regarded as some of the most toxic man made substances; dioxins have been reported to be 500 times more toxic than strychnine, and 10,000 times more potent than cyanide16; There is also a fear

of a long term malignant effect, which has not been proven.16 Dioxins and furans are thought to be formed as a result of poor combustion, by complex reactions involving the pyrolysis and combustion of PVC plastics ,chlorophenols and benzenes;and lignin and chlorine, which are ubiquitous in municipal,wastes.6

Canadian experts have cited improper waste incineration as one of the largest sources of dioxins emitted into our environment.7 The Swedish government has placed a moratorium on the construction of new MSW incinerators, because of recent evidence of widespread dioxins in their environment; believed to be coming from existing waste incinerators, many of which lack proper controls. This Moratorium does not mean that Sweden has no faith in incineration technology, rather they are awaiting the evaluation of new BACT technology, and environmental standards.17.

While the poor combustion of MSW has significant potential to form dioxins, the improper combustion of hospital wastes for example , has a much greater dioxin/furan emission potential, because the plastic content of hospital wastes is about 5 times greater than MSW.7 Many experts believe that existing hospital waste incinerators, which are mainly poorly controlled, are emitting more toxic emissions than hazardous waste incinerators that comply with USEPA RCRA regulations.7.

There is much controversy concerning the formation of dioxins and furans in waste incineration,8 and whether efficient combustion can minimize dioxins and furans; and many theories exist. I shall briefly summarize what I believe to be true.

Summary of Key Dioxin/Furan Emission and Control Issues

1.Dioxins and furans are formed from the pyrolysis,and partial oxidation, of PVC , chlorophenols and benzenes etc.and by the primary reaction of nonchlorinated organics with chlorine, from both organic and inorganic halogens in waste; by comlex reactions which are not well understood.

2.I agree with Shaub that dioxins and their precursors can form on the grate bed of the combustion zone8; but they also can form later in post combustion zones , especially from continuing thermal reactions on incandescent particles.

3.Dioxins and furans exist in both vapor and on fine particles in MSW and hospital waste incinerator emissions, and may be present at levels up to 80% in the vapor phase of MSW incinerator emissions.5,7,9,10.

4.Dioxin and furans can be minimized by high combustion efficieny waste incineration.3,4,5,6,7,9,11,12.Recent studies by Cavallaro et al in Europe have shown dioxin reductions of greater than 99% with MSW incinerator afterburners operating, compared to the burners being shut off.12.

5.High combustion efficiency MSW incineration can result in acceptable, safe dioxin/furan emission levels; although it is uncertain whether such low levels can always be achieved by combustion alone, without supplementary controls. Recent tests of the Westchester Resource Recovery Facility have indicated very low dioxin/furan emissions, at greater than 99.9% combustion efficiency; with PCDD/PCDF emissions far less than the 500 ng/cm PCDD/PCDF emission level certified as safe by the US Army Surgeon General for the incineration of PCP coated wood in hazardous waste incinerators.13

6.Dioxins and furans behave like PCB's and will condense onto fine particles at temperatures of 300F and less, for proper collection and removal by a fabric filtration system .4,6,7,9,10,11.Dr.A.Teller and I initially proposed this concept in 1983, based on studies of European MSW incinerator dioxin data.9 Recent Danish dry scrubber tests have confirmed greater than 99% dioxin/furan removal at about 120C, as we previously predicted. Hence efficient collection devices operated at temperatures in the 200-300F range should provide a "belt and suspenders" approach.This should be reassuring to people who do not have confidence in combustion technology.4.

7.Sulfur in wastes may inhibit the formation of dioxins, because of the Deacon reaction favoring HCl formation, instead of in-situ Chlorine, which is believed to react with precursors more readily than HCl, to form dioxins; this may explain why virtually no dioxins have been found in coal combustion emissions.14 The presence of in-situ chlorine in MSW and hospital waste incinerators, which is believed to be greater in excess air combustors, versus controlled air combustion systems, should be further evaluated as factors in dioxin formation in MSW and hospital waste incineration.

8.Dioxin and furan emissions from previously tested hazardous waste incinerators are generally an order of magnitude less than such emissions from MSW incinerators generally equipped with electrostatic precipitators.15 This may be because all hazardous waste incinerators are required to operate at high combustion efficiencies of 99.9% and have scrubbers to control acid gases, that also condense and remove dioxins; unlike many conventional MSW incinerators.

Heavy Metal Emissions

We previously discussed the comlexity of our wastes and the presence of heavy metals such as lead , cadmium, etc. from batteries and electrical scrap; which form toxic metal fumes when incinerated; some of these toxic metals, like arsenic and cadmium are also believed to be carcinogenic. Likewise, hospital wastes may also contain toxic, radioactive metallic compounds that are also present in fine, submicron particles in incinerator emissions. It is believed that heavy metal

emissions can be highly variable, and may pose chronic, long term health effects; the enhanced toxic effects of heavy metals and acid gas emissions should be further studied.

Like dioxins, studies of heavy metal emissions have revealed that a reduction in the exhaust gas stream temperatures will result in increased condensation of these contaminants onto fine particles where they can be effectively removed by a fabric filter.5 Previous studies show that about 75% of heavy metals are concentrated on particles less than 2 microns; thus ESP's with their submicron window, will not be effective in controlling these contaminants.

Conclusion.What are Safe BACT Standards for MSW and Hospital Waste Incineration?

BACT is a confusing term; to most of us it should mean the best air cleaning technology; however USEPA BACT interpretations define BACT as 0.03 gr/scf; which are not the best standards ,and do not consider the problems of toxic, non criteria air contaminants. California requires 0.01 gr/scf overall for the control of particulates, and 0.008 gr/scf for particles less than 2 microns19. Several other states, such as Connecticut, New Jersey, and recently Florida, have specified BACT as close to LAER, lowest achievable emission rate, as 0.015 gr/scf for particulate emissions from MSW incinerators; New York State has proposed a similar,0.02 gr/scf emission standard for the N.Y.City area.

For acid gases, the states of California, New Jersey, Mass., Maine, Oregon, Utah, Michigan,and the City of New York6; and recently Florida have proposed acid gas controls for new waste to energy MSW incinerators, as BACT; similar to existng acid gas control requirements that have existed in Europe for many years 11.

The New York State Legislative Commission on Solid Wastes recently studied the state of the art of MSW resource recovery in Norway, Sweden, Denmark and Germany 11, and concluded that :

1."For waste to energy systems, the most significant improvements have come in the area of acid gas control technology."

2."There is promise that effective limitation of dioxins can be achieved through high quality dry scrubbing and fabric filtration technology".

3."All new facilities proposed for New York State should be required to control acid gas emissions to at least 90%; Particulate removal to less than 0.02gr/scf is a reasonable standard for all new plants to achieve; and fabric filtration and dry scrubbing technology would probably be needed to achieve these levels".

In addition to the above BACT recommendations, MSW incineration combustion efficiency should be maintained at 99.8% or greater on a daily average and at least 99.5% on a

short term hourly basis.18

There are also many other proper MSW incineration design and operational factors that represent BACT, and can be incorporated into source permits; which can be found in the references; such as combustion zone temperatures, residence time, etc.4,5,11,18,19.

Hospital incinerators are generally not properly controlled, and should be regulated similar to hazardous waste incinerators; taking into account design and operational differences. However, proper controlled air , high combustion efficiency incinerators should be specified for hospital wastes, as certain states such as California now require. Hospital waste incinerators should also be equipped with appropriate air scrubbing systems to properly control dioxin/furan, heavy metal, radioacive, and acid gas emissions.20

The specification of proper BACT waste incineration and air pollution control technologies, can insure that all toxic air contaminants and acid gases will be adequately controlled; we must redefine The USEPA definition of BACT, to include acid gases and toxics as several progressive states have already done. There need no longer be a burning issue of toxic emissions from waste incineration.

References

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2."Effects of Municipal Solid Waste Preprocessing on Thermal Conversion Of MSW in Mass Burn Incineration". National Recovery Technologies Nashville Tenn. 5/31/85 report for the U.S.Dept. of Energy.

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4.Hasselriis,F.W."Technical Guidance Relative to Municipal Waste Incineration";prepared for the N.Y.S.Dept.of Environmental Conservation Task Force on MSW Incineration,8/18/85.

5.Lauber J.D."Arguments in favor of BACT for Resource Recovery Facilities , a report to NYSDEC 10/12/84; presented to Ct.DEP 10/19/84 for the Mid Ct.Resource Recovery public hearing.

6.Clarke M.J. "Discussion Paper on BACT for Resource Recovery from a Municipality's Perspective " Fourth Annual Resource Recovery Conference 3/27/85,Washington D.C.

7.Doyle B.W. Drum D.A.,Lauber J.D. "The Smoldering Question of Hospital Wastes".Pollution Engineering Magazine,July 1985.

8."Resource Recovery in New York State,The Dioxin Controversy;Joint Legislative Commission on Solid Waste management,11/85.

9.Teller A.J.,Lauber J.D."Control of Dioxins from Incineration",presented at the 76th annual meeting of the Air Pollution Control Association ,Atlanta Ga. June 1983.

10.Nielsen K.K. Moeller J.T. ,Rasmussen S."Reduction of Dioxins and Furanes by Spray Dryer Absorption for Incinerator Flue Gas".Dioxin 85 conference Bayreuth W.Germany 9/85.

11.Hinchey M.D.et al;"Resource Recovery and Solid Waste Management in Norway,Sweden Denmark,and Germany; Lessons for New York."A report of the NYState Assembly Legislative Commission on Solid Waste,1/86.

12.Cavallaro A. Gorni et al "Dioxin pollution,Waste Incineration Monitoring and Contribution to Environmental Contamination "189th meeting of the American Chemical Society Miami Beach Fla.1985.

13.US Army Environmental Hygiene Agency Final Report

Statinary Source Assessment #42-21-0198-83.

14.Griffin R.D. " A new Theory of Dioxin Formation in MSW Combustion", APCA annual meeting Detroit Mich.6/85.

15.Midwest Research Institute "Performance Evaluation of Full Scale Incinerators Final Report to USEPA 8/84.

16.Brunner C.R. "Hazardous Air Emissions from Incineration"Chapman and Hall,1985.

17.October 28,1985 letter to Mr.John Milliken USEPA OSW from Mr.O.Aslander, Deputy Director National Swedish Environmental Protection Board.

18.Drum D.A." A Control Strategy for MSW Incineration" presented at the APCA annual meeting Detroit Mich.6/85.

19."Air Pollution Control at Resource Recovery Facilities",a report of the California Air Resources Board 5/24/84.

20.Doyle B.W. Drum D.A.,Lauber J.D. "The Burning Toxic Issue of Hospital Waste Incineration";to be presented 6/86 at the Third International Conference:Environmental Quality and Ecosystem Stability;Jerusalem,Israel.

RESOLUTION UNANIMOUSLY ADOPTED BY THE BOARD OF DIRECTORS OF COOCVE

TUESDAY, JULY 22, 1986

WHEREAS, Broward County contemplates the erection of a waste disposal plant at or near the intersection of N.W. 48th Street and Powerline Road, Broward County, and it is estimated that the said plant will operate 24 hours a day and burn 1760 to 2200 tons of garbage daily, and

WHEREAS, Century Village East, Deerfield Beach, is in close proximity to the aforesaid site, and the health of its 15,000 residents, as well as the health of the other residents of Deerfield Beach and the other Broward County residents living in close proximity, may be seriously affected, and the quality of life of all such residents impaired, and

WHEREAS, the Department of Environmental Regulations, as well as many other highly qualified experts in the field, have recommended that scrubbers and baghouse filters MUST be installed to control the emission of acid gases or ashes that contain deadly mercury, lead, zinc or other toxic emissions, and

WHEREAS, the Condominium Owners Organization of Century Village East, Inc., also known as COOCVE, Inc., is the umbrella organization representing the aforesaid 15,000 residents of Century Village East and

WHEREAS, upon motion of the Civic Committee of COOCVE, the Executive Committee voted to recommend to the Board of Directors of COOCVE the adoption of a motion to support a resolution as aforesaid, it is

NOW, on motion duly made and seconded,

RESOLVED, that this Board of Directors wholly supports and adopts the resolution requiring that the members of the Broward County Commission require that the design and construction of the North Broward Resource Recovery Plant include such scrubbers, baghouse filters and any other equipment or accessories which may be required to achieve the aforesaid pupose and

IT IS FURTHER RESOLVED, that a copy of this Resolution be forwarded to each of the Broward County Commissioners and any other entity involved with the design and construction of the aforesaid waste disposal plant.

Concerns Posed Regarding Garbage Plant

Cancer threat from Plant Emissions prompts AAAS complaint

by Karl Scheller, Ph.D.

Concerns regarding the health hazards posed by Broward County's proposed garbage burning plant have been augmented by a very recent scientific analysis of the toxic effects of airborne dioxins. In a paper presented to the American Academy for the Advancement of Science this past May 29th, the Center for the Biology of Natural Systems at Queens College postulated that exposure to dioxins and related compounds will cause 330 to 1440 cases of cancer per million Americans over a 70 year lifetime of exposure. Most of these substances, to which Americans are exposed, come from the burning of municipal and industrial wastes in garbage incinerators, according to Dr. Barry Commoner, an internationally recognized environmental scientist, co-author of the paper and director of the Queens College center. The report called for action by the E.P.A. to limit such emissions and noted that the cancer risk from dioxins was far higher than that of benzene, which is already controlled by the environmental agency.

The cancer risk from benzene is 74 cases per million people over a lifetime exposure. Dr. Commoner asserted that cancer risks from incinerated trash, already very serious, can be expected to grow with the increasing construction of garbage burning plants by local authorities.

This latest disclosure, before a distinguished scientific audience, highlights other questions regarding the environmental impact of the Broward County Resource Recovery Plant. The burnable trash contains carbon, hydrogen, nitrogen, sulfur, chlorine and fluorine which form gaseous compounds upon combustion. Most of them are harmful pollutants, which will be emitted into the atmosphere in large quantities because the plant will not use the best available pollution control technologies (BACT). The garbage also contains small quantities of lead, mercury, beryllium and arsenic, which will not be trapped in their entirety by the electrostatic precipitators (ESP) specified in the plant design.

The Florida Administrative code establishes significant emission rates for regulated air pollutants. The proposed plant will exceed these levels for the following substances; Particulate Matter (PM), sulfur dioxide (SO2), nitrogen dioxide (NO2), carbon monoxide (CO), lead fluorides, beryllium, mercury, sulfuric acid mist, and arsenic. In the light of this circumstance, Broward County has proposed the emissions to be discussed below as BACT limitations for the facility.

Particulate Matter

Based upon a rated capacity of 2200 tons of mixed solid waste per day, P.M. emission is specified to be 168 tons per year, close to seven times the significant emission rate for PSD (prevention of significant deterioration of air quality). This deviation is rationalized upon the basis that it is consistent with two recent permit approvals in Florida (Pinellas County and Bay County).

Sulfur Dioxide

Proposed emission is 1987 tons per year as compared with a significant emission rate for PSD of 40 tons/year. The Florida DER (Department of Environmental Regulation) sets a limit of 1124 tons per year as Best Available Control Technology utilizing a scrubber for control of flue gases.

"Exposure to dioxins and related compounds will cause 330 to 1440 cases of cancer per million Americans over a 70 year lifetime of exposure."

Paper by Dr. Barry Commoner presented to AAAS

Nitrogen Oxides

Proposed emission and significant emission rates are identical with those for sulfur dioxide. However, the D.E.R. accepts these as BACT.

Carbon Monoxides

The proposed CO emission limit of 0.8 lbs per ton corresponds to virtually complete combustion, a rather unlikely condition. A California Air Research Board study in 1984 found CO emissions ranging from 1.6 - 18 lbs/ton for mass-burn units. EPA (1984) cites a factor of 35 lbs per ton in agreement with the maximum value of 34.8 lbs/ton reported by A. D. Little, (1981) in a literature survey. These findings support the supposition that combustion is not complete, enhancing the probability of formation of dioxin and other hazardous chemicals.

Lead

A 1984 study by the California Air Research Board (CARB) found lead emissions to range from 0.12 to 3.33 lbs per ton with an average of 0.2 lbs/ton. The Broward County facility proposes to achieve an emission limit of 0.02 lbs per ton with a high efficiency ESP. One will just have to wait and see.

Mercury

The County proposes an emission limit of 18.2 lbs day corresponding to a yearly total of approximately 6,650 lbs. The DER sets a maximum rate of 7 lbs per day for the facility, about 38% of the specified rate. Mercury affects the nervous system and may engender deterioration of the brain.

Fluorides

An emission limit of 0.16 lbs per ton is proposed by Broward County, 8 times the BACT emission limit set by the DER, utilizing a scrubber. Fluorides will appear principally as hydrogen fluoride (HF), a particularly nasty and corrosive compound.

Sulfuric Acid Mist

The Broward County Resources Recovery Facility proposes an emission rate of 168 tons/year as compared with the 20 ton per year BACT limit set by DER utilizing a scrubber. Gases are free to spew forth into the atmosphere at uncontrolled rates with the ESP device intended for the plant. Hydrogen Chloride (HC1) is estimated to be emitted at a maximum rate of some 4500 tons per year. Both these substances form extremely corrosive acids and require a scrubber to reduce emission to innocuous levels.

The plant designers of the garbage burning facility dispose of the large deviations from environmental standards with pollutant dissemination calculations purporting to demonstrate that excessive emissions will have a negligible effect on ambient air quality. It remains to check their dispersion models in detail.

One final word might be in order regarding prevailing wind patterns in our area, in view of the cavalier dismissal, by some of our city fathers, of the possibility that effluents from the garbage plant might be wasted in the direction of Pompano Beach. The closest existing weather station to the proposed plant, with complete meteorological data, is located in Miami. Their data for the 6 year period from 1969 to 1974 reveals that easterly winds prevail, on an annual basis, slightly less than 19% of the time. The rest of the time, of course, it blows from all other points of the compass, due North to due South.

Dr. Scheller is an internationally known expert on Combustion Physics. He earned his doctorate at Ohio State University and is the author of a number of monographs on the physics of combustion. He serves on the Pompano Beach Environmental Review Board.

Garbage plant safeguards lacking says Palm-Aire scientist

By Laurence D. Locker, Ph.D.

The revenue from the largest bond issue in Broward County history will be used to build two huge garbage burning plants. As the growth of Broward County continues, the disposal of solid waste has become an important problem.

The garbage burning method chosen by the County Commission to meet the 20 year future need is called "resource recovery." What this term actually means and what the effects of mass burning of garbage will be on the environment should be of utmost importance to all residents of Pompano Beach.

One of the proposed plants will be located in unincorporated Broward County, on Powerline Road just north of Sample Road and the Pompano Beach city limits. The cost of the plant is estimated at approximately $200 million. It will burn unseparated garbage and trash collected from the north Broward area, instead of relying solely on the existing sanitary-land fills now being used.

The idea of resource recovery is to use some of the heat produced by the garbage burning to generate electricity, just as turbines now generate electricity from the burning of fossil fuels. However, since there is no shortage of conventional sources of electricity in our community, this is not a significant factor in choosing to solve the solid waste disposal problem.

What is really needed is the most cost effective method that is consistent with environmental safety.

The mass burning approach has had some serious problems. Some garbage plants have been shut down completely while others continue to operate.

Two years ago the Pompano Beach City Commission appointed an Environmental Review Committee to examine the impact on the air and water quality of our community of the County-proposed garbage plant which would burn 2,000 tons of trash per day. As Chairman of this committee, I was fortunate to find local residents knowledgeable in the necessary areas of technology.

Members of the committee include Bob Simon, a professional engineer, Deborah Nycz, an organic chemist and Dr. Karl Scheller, a chemical engineer with worldwide renown as an expert in combustion.

The committee had no preconceived biases about the validity of resource recovery as a solution to the problem of solid waste disposal. We decided from the outset not to play the role of fear merchant by making emotionally charged accusations about poisoning of the aquifer and pollution of the air. We wanted to support every conclusion with data on the design of the plant. This has not been easy.

The basis of the first of the committee's two major conclusions is that there is insufficient data furnished to evaluate the performance of the plant.

The second conclusion is that the choice made by the plant designer not to use the best available pollution control technology will permit large quantities of harmful pollutants to be emitted into the atmosphere.

When fuels are burned, the basic chemical elements of carbon, nitrogen, oxygen and sulfur combine to form oxides. If the combustion is complete then the oxides are carbon dioxide, nitrogen dioxide and sulfur dioxide. Carbon dioxide is harmless, except for the "greenhouse" effect or long-term warming of the atmosphere caused by carbon dioxide impeding infrared rays from being radiated out into space.

The other oxides however are significant health hazards. Sulfur dioxide is associated with acid rain which can kill the living organisms in bodies of water, such as wildlife, fish and vegetation. It can pose health hazards including lung trauma and increased incidents of lung cancer. Nitrogen dioxide can cause heart and lung disorders and is especially hazardous for people with chronic respiratory ailments.

The technology of the County-proposed garbage plant makes no attempt to remove these gases. As a result, the gases are discharged directly into the air.

There is also no attempt made to remove the harmful chemical elements before the garbage is fed into the incinerator. Therefore, metals such as lead and mercury will also be released into the atmosphere. Both lead and mercury can cause deterioration of the nervous system and impairment of mental faculties. We are all poignantly aware of the dangers of lead-based paint, particularly with regard to children.

also be released as a product of the combustion of plastics.

These materials are discharged into the atmosphere even in the ideal situation where there is complete combustion. Additional problems arise when the burning is not complete.

The lack of complete combustion means that there is still burnable material in the ash residue. Calculations used by the designer of the plant assume that 100% combustion occurs at the operating temperature of 1,500 degrees Fahrenheit. This is highly unlikely.

The irregular shape of the garbage fuel and its time in the flame prevent complete combustion. It is then that such extremely toxic materials such as dioxin, nitric oxide and other hazardous chemicals can form.

Pollution control devices can be installed to remove many of the potentially toxic chemicals. There are three basic types of control devices.

The first is called a scrubber. It removes gases such as sulfur dioxide and hydrogen chloride by chemical reactions with other materials. Although there are still some problems associated with the disposal of the ash residue, these problems are small compared to the benefit of removing the pollutants from the air.

Some of the toxic material such as lead and mercury attach themselves to fine soot particles. This second control device method called "electrostatic precipitation" is used to remove some of these particles. This method does not remove any of the gases such as sulfur dioxide and nitrogen dioxide. The method works by deflecting the particles out of the stack gas stream by using an electric field. The principle is similar to the deflection of an electron beam in a TV tube.

When the particles are too small to be effectively removed by the electrostatic precipitators, they can still be filtered out of the stack gas stream. The control device used is called baghouse filters which effectively remove the small particles that contain large amounts of toxic chemicals.

The importance of the filter method is that the filters remove the small particles considered to pose the most significant health hazard, which are not removed by the electrostatic precipitators.

A major concern about the County-proposed garbage plant is that the design only electrostatic precipitators are to be used. This decision is alarming because it means that most of the products of combustion will go into the atmosphere without control.

The federal guidelines require the use of the "best available control technology" (BACT). The Florida Department of Environmental Regulation (DER) advocates the use of baghouse filters and scrubbers as the best available control technology. Pompano's Environmental Review Committee supports the DER's position.

The Environmental Review Committee has identified the potential problems in the design of the County-proposed garbage plant to be built near Powerline and Sample Roads. If the plant is built as presently designed, the citizens of Pompano Beach as well as those of the surrounding communities of Coconut Creek, Margate, Coral Springs and Deerfield Beach will be faced with the health hazards associated with the uncontrolled emission of toxic pollutants in the air.

The City of Pompano Beach had the foresight to look into the environmental impact of garbage burning two years before the permitting process began. We have now reached a critical juncture. The citizens of all of the affected communities in North Broward County must assert their influence on their municipal governments as well as the Governor and Cabinet who must review the plant design to demand the technology that will control the emission of toxic pollutants. Until there are sufficient safeguards against pollution to protect the long-term health of the community, the garbage plant should not proceed further.

Dr. Locker, who is a resident of Palm-Aire, has a BS degree in chemical engineering from Syracuse; MS degree in chemical engineering from MIT and a PhD in metallurgy and materials science from MIT; he owns Advanced Chemical Sensors Co. which manufactures and develops devices to measure toxic vapors and is an adjunct professor of physics at FAU. He has authored a book on solid state devices for chemical detection and has had scientific articles published in 20 technical journals and has written two chapters in technical text books.