STATE OF ILLINOIS
POLLUTION CONTROL BOARD
JAMES R. THOMPSON CENTER
100 W. RANDOLPH STREET, SUITE 11-500
CHICAGO, ILLINOIS 60601

BEFORE THE
ILLINOIS POLLUTION CONTROL BOARD

Anielle Lipe Nykole Gillette Complainants	)	
v.	)	PCB 12-44
Village of Richton Park Respondent	)	

RESPONSE TO MOTION
(PROOF OF SERVICE)
The undersigned hereby files a response.

Anielle Lipe
22123 Meadow Lake Place
Richton Park, IL 60471

Nykole Gillette
22232 Scott Drive
Richton Park, IL 60471

Under penalties of perjury, we the undersigned certify as true that we served the foregoing upon:

Village of Richton Park
4455 Sauk Trail Avenue
Richton Park, IL 60471

by placing a true and correct copy of same into a properly addressed, Priority Mail envelope with sufficient postage, and mailing it at the cashier window at the Matteson Post Office, 20650 South Cicero Avenue, Matteson, IL on or before 6:00 P.M. on November 8, 2011.

Complainant (s) Anielle Lipe Date 11/9/11

Complainant (s) Nykole Gillette Date 11/9/11

Subscribed to and sworn before me this 9 day of November, 2011.

Karmele Pinckney
Notary Public

My commission expires 1/27/2015

OFFICIAL SEAL
KARMELE PINCKNEY
Notary Public - State of Illinois
My Commission Expires Jan 27, 2015

==========

MATTESON PO
MATTESON, Illinois
604439998
1615500443-0098
11/08/2011 (800)275-8777 05:54:00 PM

==========

Sales Receipt

Product Description	Sale Qty	Unit Price	Final Price
RICHTON PARK IL 60471 Zone-1 Priority Mail Flat Rate Env 9.20 oz.			$4.95
Issue PVI:			$4.95
Total:			$4.95

Paid by:
Cash $5.00
Change Due: -$0.05

Order stamps at usps.com/shop or call 1-800-Stamp24. Go to usps.com/clicknship to print shipping labels with postage. For other information call 1-800-ASK-USPS.

****
****

Get your mail when and where you want it with a secure Post Office Box. Sign up for a box online at usps.com/poboxes.

****
****

Bill#:1000401877351
Clerk:12

All sales final on stamps and postage
Refunds for guaranteed services only
Thank you for your business

****
****

HELP US SERVE YOU BETTER

Go to:
https://postalexperience.com/Pos

TELL US ABOUT YOUR RECENT POSTAL EXPERIENCE

YOUR OPINION COUNTS

****
****

STATE OF ILLINOIS
POLLUTION CONTROL BOARD
JAMES R. THOMPSON CENTER
100 W. RANDOLPH STREET, SUITE 11-500
CHICAGO, ILLINOIS 60601

BEFORE THE
ILLINOIS POLLUTION CONTROL BOARD

Anielle Lipe Nykole Gillette Complainants	)	
v.	)	PCB 12-44
Village of Richton Park Respondent	)	

COMPLAINANTS, ANIELLE LIPE & NYKOLE GILLETTE REPLY IN SUPPORT OF MOTION TO HEAR OUR CASE

Complainants, Anielle Lipe and Nykole Gillette request that the Pollution Control Board continue to review and hear our complaint because it is not frivolous or duplicative within the meaning of Section 31(d) of the Act (415 ILCS 5/31(d)) and Section 101.202 of the Board's procedural rules (35 Ill. Adm. Code 101.202).

In review of the Illinois Environmental Protection Act, Sexton Properties LLC in Richton Park is considered a Pollution Control Facility. Pursuant to the Illinois Environment Protection Act that is located in the Illinois Compiled Statues (ILCS) at 415 ILCS 5/1 et seq, in Sections 3 330, 39, 39.2, and 40.1, "a **Pollution Control Facility** is defined as any waste storage site, sanitary landfill, **waste disposal site**, waste transfer station, waste treatment facility or waste incinerator." Sexton Properties R.P., LLC is a waste storage facility and would also be considered a waste disposal site because some of the proposed crushed material/solid waste would be emitted in the air and escape into the environment instead of being used for recycling or developing the site. The additional definitions: Waste Disposal, Solid Waste, Disposal, Fly Ash, Particulate Matter, and a detailed discussion on pollution emitted in the air from a crushing operation will clearly show that Sexton Properties R.P , LLC is a Pollution Control Facility. Therefore, this proposed crushing operation constitutes that Sexton Properties R.P., LLC should have complied with all the local siting processes before the Village of Richton Park granted the Ordinance # 1497, a Special Use Permit to allow a concrete crushing operation on their site.

Per (Exhibit A1), the Illinois Environmental Protection Agency states "**Waste Disposal** includes, among other things, dumping waste on the ground, storing it in piles on the ground, in a landfill, or in lagoons and storing waste indefinitely, even when it is held in tanks, buildings or containers." In fact, the Illinois EPA indicates that "all waste is referred to as **solid waste**." "Something may be a waste if it no longer has a dollar value or if it is used carelessly, spilled, burned, buried or poured down the drain." Per the Illinois EPA regulations, "the term solid waste not only includes solid material but also includes liquids and **gasses**." Pursuant to the Illinois Environment Protection Act that is located in the Illinois Compiled Statues (415 ILCS 5/3.185) (was 415 ILCS 5/3.08), Sec. 3.185 defines "**Disposal** means the discharge, deposit, injection, dumping, spilling, leaking or placing of any waste or hazardous waste into or on any land or water or into any well so that such waste or hazardous waste or any constituent thereof may enter the environment or be **emitted into the air** or discharged into any waters, including ground waters."

(Exhibit K1) the book entitled, "Highway Engineering page 618 states that "portland cement concrete" may be defined as a plastic and workable mixture composed of mineral aggregate such as sand, gravel, crushed stone, or **slag**, interspersed in a binding medium of cement and water." Per page 619 it states that **"the materials included in concrete, as generally used in highway construction, are coarse aggregate, fine aggregate, water, cement, and one or more admixtures."** "Coarse aggregates most frequently used in portland cement concrete include crushed stone, gravel, and **blast-furnace slag**." Per (Exhibit B1), Utilization Of Hazardous Wastes By-Products As A Green Concrete Material Through Stabilization/Solidification (S/S) Process: A Review page 49 under the heading of 3.2. Waste materials, it indicates that the "various properties of **concrete** containing by-products and waste materials such as Granulated Blast Furnace Slag, **Fly Ash**, Bottom Ash, **Silica Fume**, Waste Glass as mineral admixture, aggregate replacement or binding material." Per (Exhibit C1), Solid Waste Management Facilities defines "**Fly ash** means the residue from the combustion of solid waste, which is entrained in the gas stream of a solid waste combustor. Fly ash includes particulates, cinders, soot, and solid waste from air pollution control equipment". In summary, per (Exhibit D1), the Illinois Environmental Protection Agency page 2 states that Particulate Matter is also known as air pollution.

Sexton Properties R.P., LLC, a Pollution Control Facility is a waste disposal site that:

1. Stores piles of solid waste consisting of concrete, asphalt and other materials. Please see photos per (Exhibit E1, F1, and G1).
2. When crushing concrete, the IEPA expects some of the cement dust/solid waste will be emitted in the air which contains particulate matter or pollution such as Fly Ash, Bottom Ash, Silica Fumes, Blast Furnace Slag and etc. Per (Exhibit H1), the United States EPA, page 1 under the heading of **Health** states "the size of particles is directly linked to their potential for causing health problems. Small particles less than 10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream. Exposure to such particles can affect both your lungs and your heart. Small particles of concern include "inhalable coarse particles" **(such as those found**

near roadways and dusty industries), which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter; and "fine particles" (such as those found in smoke and haze), which are 2.5 micrometers in diameter and smaller." Per (Exhibit I1), the Environmental Engineering book, Figure 7-3, page 432, Fumes, range "in size from .03 to .3 micrometers." Fly ash ranges "in size from 1 to 1000 micrometers." Since both Silica Fumes and Fly ash have levels under 10 micrometers, these particulates are a hazard to human health.

Per (Exhibit H1), the United States EPA, page 1 under the heading of **Health Effects** states "Particle pollution- especially fine particles- contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, for example;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks; and
- premature death in people with heart or lung disease.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure. However, even if you are healthy, you may experience temporary symptoms from exposure to elevated levels or particle pollution." In review of the above information, it is unclear as to whether there are any safe levels for humans when being exposed to particulate matter, especially under10 micrometers.

The particulate matter has negative effects on the environment. Per (Exhibit H1), the United States EPA on pages 1 and 2 under the heading of Environmental Effects states "**Visibility reduction** fine particles (PM 2.5) are the major cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas. **Environmental Damage** particles can be carried over long distances by wind and then settle on ground or water. The effects of this settling include: making lakes and streams acidic; changing the nutrient balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems. **Aesthetic damage** particle pollution can stain and damage stone and other materials, including culturally important objects such as statues and monuments."

In reference to capturing the emitted particulate matter, per (Exhibit B), Derenzo and Associates report page 3, it states "the specified control measures are expected to reduce uncontrolled particulate and dust emission at the planned waste concrete crushing and processing operations by at least 80%." Therefore, 20% of the cement dust emitted into the air would be considered waste/solid waste. (Exhibit B), page 2 of the Derenzo and Associates, Inc. report, indicates that "a total of approximately 250,000 tons of waste

concrete material will be processed at their site annually." Therefore, approximately 250,000 tons of waste concrete material processed annually times 20% emission of pollutants in the air = approximately **50,000 tons of cement dust/particulate matter emitted in the air annually.** Yet per (Exhibit D1), the Illinois Environmental Protection Agency page 2 states "the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design after any required reduction by air pollution control devices is PTE 250 tons per year. Note that this is calculated considering the maximum capacity of the equipment (use 8760 operating hours per year)." As you can see, Derenzo and Associates projection of the pollution in the air will far exceed the maximum IEPA capacity. When figuring the 3 year permit granted by the Village of Richton Park that equates to approximately **150,000 tons of cement dust/particulate matter emitted in the air over a 3 year period**. Per the IEPA, over a three year period, the maximum emission capacity in the air should not exceed 750 PTE (250 PTE tons per year times 3 years). The Derenzo and Associates' projected emissions from the crushing operation indicate that the potential to emit will far exceed the IEPA's limit.

What is also important to mention is that there will be hazardous gasses emitted from the pollution control equipment. Per (Exhibit J1), the Environmental Health Sourcebook, Second Edition referenced the U.S. EPA's year 2000 fact sheets series called, "Air Quality Where You Live" (see footnote on page 149). Here the U.S. EPA discussed the six common air pollutants regarding outdoor (ambient) air quality. On pages 153 and 154 of the Environmental Health Source, Second Edition, some chief causes of concern for **nitrogen oxides (NOx)** are listed. Nitrogen oxide "reacts to form nitrate particles, acid aerosols, as well as NO2." Nitrogen oxides also cause "respiratory problems," "reacts to form toxic chemicals," and it "contributes to global warming." On pages 154 and 155 it state that **nitrogen oxides, sulphur dioxide, and the pollutants that are formed from them "can be transported over long distances."** In summary, as of 1970, the emissions of **nitrogen oxides** have **"increased approximately 10 percent."** On page 150 it states that **volatile organic compounds (VOC)** combine with nitrogen oxides and form a chemical reaction "in the presence of heat and sunlight." "At ground level" this produces ozone gas. Ozone gas "triggers a variety of health problems even at very low levels, may cause permanent lung damage after long term exposure, and damages plants and ecosystems." Another air pollutant mentioned on page 152 that is produced by the emissions from the pollution control equipment is **carbon monoxide** "can affect people with heart disease" and "the central nervous system."

What remains unclear is how much particulate matter is in the 250,000 tons of concrete proposed to be crushed annually plus the particulate matter from the control pollution equipment to determine the exact PTE? The Village of Richton Park or their engineering expert, Derenzo & Associates have not answered our questions nor proved that this crushing operation would be safe to human life or the environment. Also it is unknown as to how much or how long someone has to be exposed to the particulate matter before it would cause serious illnesses or fatality from the emissions.

Due to the high concentration of particulate matter in the air, this would be considered air pollution. Pursuant to the Illinois Environment Protection Act that is located in the Illinois Compiled Statues (415 ILCS 5/3.115) (was 415 ILCS 5/3.02) "Air pollution is the presence in the atmosphere of one or more contaminants in sufficient quantities and of such characteristics and duration as to be injurious to human, plant, or animal life, to health or to property, or to unreasonably interfere with the enjoyment of life or property."

As a result, not all of the proposed crushed concrete will be recycled or used for development, and the solid waste that escapes into the air and environment during a crushing operation qualifies Sexton Properties R.P., LLC as a **Pollution Control Facility.** Therefore, it is warranted that Sexton Properties R.P., LLC follow all the local siting guidelines in the Illinois Environmental Protection Act.

Based on the facts mentioned above, the local siting decision of the Village of Richton Park approving Ordinance # 1497 can be revoked by the Illinois Pollution Control Board. Pursuant to the local siting process found in the Illinois Environmental Protection Act that is located in the Illinois Compiled Statues (ILCS) at 415 ILCS 5/1 et seq, in Sections 3.330, 39, 39.2, and 40.1 indicates that "if the local government grants siting approval, a citizen opposed to the development may appeal the decision to the Board." Therefore, the Pollution Control Board is acting within its legal authority of granting an appeal to revoke the Ordinance # 1497. The basis of the appeal is that the John Sexton Sand and Gravel Corporation or applicant failed to properly notify citizens of the Public Hearing held on June 14, 2011, and the Village of Richton Park neglected to follow all the processes that local officials must follow to approve a local siting for crushing concrete and other materials at a Pollution Control Facility.

The John Sexton Sand and Gravel Corporation's Public Notice in the Southtown Star Newspaper didn't properly notify Complainants, Anielle Lipe and Nykole Gillette as well as other concerned citizens as required by law of the Illinois Environmental Protection Act which is located in the Illinois Compiled Statues (ILCS) at 415 ILCS 5/1 et seq, in Section 3.330, 39, 39.2 and 40.1. The provisions that describe the local siting process are in Section 39.2 of the Act. The John Sexton Sand and Gravel Corporation's Public Notice in the Southtown Star Newspaper **failed to**:

1. Give the name and address of the applicant. Please see (Exhibit A) that states the applicant's name and address as **Sexton Properties R.P., LLC, 2801 Lakeside Drive, Suite 100, Bannockburn, IL 60015** which is noted in the application of the Village of Richton Park Special Use Petition dated 5/20/11, but not stated in the Public Notice.
2. Give the complete nature and size of the development by:
    a. Failing to mention other materials and their aggregate to be crushed.
    b. The John Sexton Sand and Gravel Corporation omitting that they expect 250,000 tons of waste concrete material will be processed at their site annually per (Exhibit B), page 2 of the Derenzo and Associates, Inc. report, .

c. Failing to mention that there would be an increase of emitted pollutants/particulate matter in the air from their operations. per (Exhibit B), Derenzo and Associates report page 3.
d. Not indicating the John Sexton Sand and Gravel Corporation's request to extend their hours of their proposed operation per Exhibit C) page 1 of the Village of Richton Park Planning & Zoning Commission Public Hearing Minutes.

3. Give the probable life of the proposed crushing operation by:
   a. John Sexton Sand and Gravel Corporation not stating in their public notice that they were applying for a three year Special Use Permit per (Exhibit D), page 1 of Ordinance # 1497.
   b. John Sexton Sand and Gravel Corporation neglecting to state in the public notice that their partnering company, Tough Cuts Concrete Services is applying for a **Life Time Air Permit** with the Illinois EPA to crush concrete in Richton Park, IL that was indicated by the employee, Mike from the Illinois EPA.
4. Give the date when the request for site approval or the Special Use application will be submitted to the Village of Richton Park Board of Trustees and Village President for approval.
5. Give a description of the right of citizens to comment on the request for the Special Use Permit or site approval.

As a result of the John Sexton Sand and Gravel Corporation omitting important information as mentioned above in their Public Notice in the Southtown Star Newspaper, the Complainants, Anielle Lipe and Nykole Gillette and many interested citizens **could not**:

- Clearly identify the applicant that was proposing this crushing operation.
- Understand the full intentions of the applicant and how their operations will affect the citizens.
- Determine the full scope and length of their proposed crushing operation in Richton Park, IL.

Due to the improper public notice of the Public Hearing in the Southtown Star Newspaper, and no public notice in a newspaper with general circulation advising of the public meetings held on 6/27/11, 7/11/11 and 7/25/11 regarding the John Sexton Sand and Gravel Corporation's proposed crushing operation, many interested citizens were not present at the public hearing or meetings to voice concerns of how the crushing of concrete and other materials emit pollutants that can negatively affect human health, cost to property, productivity, quality of life and the environment.

During the time that the Village of Richton Park Board of Trustees and Village President reviewed the Sexton Properties R.P., LLC.'s application, they failed to follow the Illinois law of abiding by all the processes that local officials must follow to approve their site for the proposed crushing operation by:

1. Approving the Special Use Permit Ordinance #1497 without the John Sexton Sand and Gravel Corporation giving proper notice of the Public Hearing held on June 14, 2011.
2. Not providing proof to the public that our quality of life, human health, safety and welfare would not be negatively impacted.
3. Failing to have a court reporter transcribe the public hearing or public meetings so that they are available for public inspection, copying and reviewing.

Sexton Properties R.P., LLC, a Pollution Control Facility did not properly notify citizens of the public hearing. Also the Village of Richton Park's Board did not abide by all the processes that local officials must follow to approve Sexton Properties R.P., LLC's site for the proposed crushing operation. Therefore, the Complainants, Anielle Lipe and Nykole Gillette request that the Illinois Pollution Control Board accept our complaint and revoke the Special Use Permit, Ordinance #1497.

Respectfully Submitted By,

Complainant (s) Anielle Lipe Date 11/8/11

Complainant (s) Nykole Gillette Date 11/8/11

EXHIBIT	IDENTIFICATION
A1.	Illinois Environmental Protection Agency (Does My Business Need A Land Pollution Control Permit)
B1.	Utilization Of Hazardous Wastes And By-Products As A Green Concrete Material Through S/S Process: A Review
B.	Derenzo and Associates, Inc. (Air Quality Impacts for Tough Cuts Concrete Services, Inc. Nonmetallic Mineral Crushing & Processing Equipment At Sexton Development)
C1.	Solid Waste Management Facilities
C.	Village of Richton Park Planning & Zoning Commission 6/14/11
D1.	Illinois Environmental Protection Agency (Does My Business Need An Air Pollution Control Permit)
D.	Village of Richton Park Ordinance # 1497
E1.,F1.,G1.	Photos of Stored Piles Of Solid Waste
H1.	US EPA (Particulate Matter)
I1.	Environmental Engineering
J1.	The Environmental Health Source Book, Second Edition
K1.	Highway Engineering Book

(Exhibit A1)

Illinois Environmental Protection Agency

www.epa.state.il.us

Pat Quinn, Governor

Publications - Pollution Control Permits

Does My Business Need A Land Pollution Control Permit?

Does my business require a permit from the Bureau of Land?

A permit from the Bureau of Land is generally required to manage waste. If you do not treat, store or dispose of some kind of waste, you will not need a land permit.

The need for a permit is dependent upon the type of waste, what you do with a waste and location of the activities.

The type of land permit that you need will be determined by the kind of waste that you manage and how you manage it.

There are a variety of waste activities that are regulated to control contamination by wastes. Because some regulated activities require a permit, you need to understand what these activities are to determine if your business needs a land permit. If your company or business activities make waste, you are a waste generator. The regulations explain how you must handle the waste while it is on your property. Waste management by the generator is a regulated activity but does not need a permit unless you conduct one of the activities described below. These are the activities that may trigger the need for a permit:

- **Waste storage** – If you store waste on your property, you must comply with all the storage requirements in the regulations. Several different sets of regulations may apply to this activity depending on who generates the waste, the classification of the waste and how long the waste is stored at your facility.
- **Waste treatment** – Any activity that changes the waste is regulated as waste treatment. Treatment includes, among other things, mixing the waste with other wastes or materials, burning, grinding or separating the waste.
- **Waste transportation** – is also regulated. If you transport the waste on a public road, you must comply with transporter rules.
- **Waste disposal** – is the most highly regulated waste management activity. Disposal includes, among other things, dumping waste on the ground, storing it in piles on the ground, in a landfill, or in lagoons and storing waste indefinitely, even when it is held in tanks, buildings or containers.

If you conduct one of these activities, please continuing reading to determine if your activities require a permit.

What is waste?

Waste is anything that is being discarded or can no longer be used for its original purpose. Something may be a waste if it no longer has a dollar value or if it is used carelessly, spilled, burned, buried or poured down the drain. All waste is referred to as solid waste. In fact, in the regulations, solid waste and waste mean the same thing. The term solid waste as used in the regulations can be misleading in another way because it includes not only solid materials but also liquids and gasses. The term "solid waste" is meant to distinguish these wastes from the wastes that are put into the sewage system through your plumbing. If you want to re-use something, it may not be a waste. The Agency's Industrial Material Exchange Section would be happy to assist you in finding someone to re-use materials for which you no longer have a use. They can be contacted at (217) 782-0450. They do not provide assistance regarding the proper management of the waste.

What is waste management?

Managing a waste refers to any kind of waste storage, treatment or disposal activity. You will hear the term "manage" used with great frequency in the land regulations and in almost any discussion of waste. Examples of waste management include burning a waste, burying a waste or storing a byproduct or sludge.

Waste management is regulated in many different ways, including the requirement to obtain a permit. However, you should be aware that many other requirements may apply. These other requirements include regulation of waste transportation, design and operating requirements for waste treatment, storage, disposal and reporting requirements on waste generation.

What type of waste do I manage?

Wastes are grouped into different categories by the regulations. You must determine which categories of waste you are managing to determine the kind of permit you will need.

Solid waste is divided into two categories: nonspecial waste and special waste.

- **Nonspecial Waste** – Nonspecial wastes are generally not as harmful to people or the environment, so they are not regulated as special waste. Nonspecial wastes include garbage and commercial waste. These types of wastes are generally associated with offices, homes and restaurants, but also include clean packaging, landscape waste, clean machinery components and construction or demolition debris.
- **Special Waste** – Special waste includes potentially infectious medical waste (PIMW), industrial process waste, pollution control waste and hazardous waste. Because the mismanagement of these wastes may cause serious health or environmental problems, special waste may be regulated under one or more sets of regulations in addition to the regulations for nonspecial waste. Special permitting requirements may also apply.
    - **PIMW** – includes most medical waste generated by health care professionals or medical research that may be infectious to humans. It does not include medical waste generated at your home. PIMW transporters must have a permit and each load must be accompanied by a PIMW manifest. Fees are associated with transportation or disposal activities. Generally, the PIMW transportation service takes care of these fees.
    - **Industrial process waste** – includes waste generated by industry or commercial services such as gas stations or painting contractors. Industrial process waste does not include clean packaging materials, office or food waste. Generally, there are state (and sometimes local) fees charged at the landfill when these wastes are disposed.
    - **Pollution control waste** – is generated by the treatment or cleanup of other wastes. Treatment residues from wastewater treatment, air scrubbing and spill cleanups are all pollution control waste.
    - **Hazardous waste** – is the most highly regulated category of waste. Some wastes are hazardous because of their ignitable, corrosive, reactive or toxic properties. These are called characteristically hazardous wastes. In other instances, U.S.EPA has decided that the waste produced by certain industrial activities will always be a hazardous waste. These are called listed hazardous wastes. There are a series of state fees collected for generating and/or handling hazardous waste. Only large quantity generators (over 2200 lbs/month) must pay a fee for generating waste.

What if I accept waste from someone else?

If you accept any waste from someone else for treatment, transfer, storage or disposal, including a facility of your own located at a different address, you must get a permit from the Bureau of Land.

The type of permit that you must obtain depends upon the kinds of waste that you accept from someone else. Even if you do not accept waste from someone else, a permit may be required for certain hazardous waste management activities.

What type of permit do I need?

Solid waste permits – are required for the nonspecial waste storage, treatment and disposal facilities

that accept waste from someone or somewhere else.

Special waste permits – are required for facilities that receive or store, treat or dispose of nonhazardous special waste and for hazardous RCRA exempt waste storage or treatment facilities. (RCRA is the acronym for the federal Resource Conservation and Recovery Act. There are separate programs that issue permits for special waste that is either hazardous (RCRA) waste or medical (PIMW) waste.

What is the permitting process?

The same system is used for permitting both solid and special waste management units.

- Development permits are required to construct new units;
- Operating permits are then required before receiving waste at a new unit; and
- Supplemental permits or modifications are required to modify an existing permitted activity.

Usually, a development permit is issued prior to construction. An operating permit is issued for operation of the business if the new unit was properly constructed. In some cases, the development and operating permits are issued jointly.

A permit for most categories of nonhazardous waste may be obtained through a single permit application. There are separate permitting regulations for medical waste, landscape waste and landfills, and separate applications must be made for each of these categories.

Hazardous waste permits – are required for hazardous waste storage, treatment or disposal facilities. A new hazardous waste management facility must obtain a Part B RCRA Permit prior to construction or to receiving waste. This is a single permit for the facility. Unlike the permits for nonhazardous waste, separate development and operating permits are not required. Annual permit and inspection fees are assessed by the state for managing hazardous waste.

The requirements for used oil are separate from other types of waste.

Used oil – means any oil that has been refined from crude oil, or any synthetic oil, that has been used and as a result of such use is contaminated by physical or chemical impurities.

Permits are not required for used oil activities but you must follow the design and operating requirements in the use oil regulations. Facilities that receive used oil from off-site and used oil transporters must register with the Illinois EPA.

How do I determine if I need a hazardous waste management permit?

To establish whether or not you need a hazardous waste management permit, you must determine:

- The type of waste (The time limits for unpermitted storage may vary by hazardous waste type);
- The amount of hazardous waste you generate per calendar month (There are time limits on the storage of hazardous waste generated onsite based upon these amounts); and
- The process that generated the waste (Some processes produce listed hazardous waste even when analysis indicates the waste would not be very harmful).

There are many instances where hazardous waste management activities may be exempt from the permitting requirements.

For further information or assistance in these determinations, you may contact the Bureau of Land Permit Section at (217) 524-3300. They will be happy to assist you.

Are there any special requirements?

Before the IEPA can review your permit application, you must provide proof that you have complied

with the local siting requirements. All new pollution control facilities must obtain siting approval from a specified unit of local government. The procedures for obtaining local siting approval and the operations which are exempt from these requirements are found in the Illinois Environmental Protection Act.

As indicated earlier, in general, all facility operators that accept waste from another location must first get a permit.

Is a land permit needed for the transportation of wastes?

The Agency recommends that you always use a licensed special waste hauler to transport your waste. Some waste transportation operations must be licensed by the Agency. There are three types of permits issued to transport waste. The uniform permit is required to transport hazardous waste. The nonhazardous special waste hauler permit, or uniform permit, is required to transport all nonhazardous waste including used oil, but not potentially infectious medical waste (PIMW). A separate PIMW hauling permit is required to transport potentially infectious medical waste. Remember hazardous waste and potentially infectious medical waste are also subcategories of special waste.

- You must have a license to transport special waste unless you are a small quantity generator transporting your own waste from your own site to a permitted storage, treatment, or disposal facility.
- If you are not a small quantity generator, you must either obtain a special waste hauler license or have a licensed special waste hauler transport the waste for you. Remember that if the special waste is hazardous the transporter must have the uniform permit. If the waste is potentially infectious medical waste, a PIMW permit is required instead of the special waste hauler permit. Used oil transporters must also register their used oil activity in addition to obtaining a special waste hauling permit.
- You must also use a manifest as the shipping paper which accompanies your waste, unless you are a small quantity generator.
- No state permit is needed to transport nonspecial waste such as garbage.

You should be aware that the transportation of hazardous material is regulated by the Illinois Department of Transportation. You may contact them at (217) 782-4974 for further information.

Supplement – You can only haul your own waste without a special waste haulers license or without a manifest if you generate 100 kg. or less of special waste including hazardous waste and less than 1 kg. of acutely hazardous waste in a calendar month. You may also qualify for an exemption from manifesting if you generate between 100 kg. and 1000 kg. of hazardous waste in a calendar month and the waste is reclaimed under a contractual agreement. The exemption for small quantity generators hauling their own waste referred to in Question #10 of this document and the exemption from manifesting for small quantity generators referred to in Question #10 of this document are not applicable to a small quantity generator as defined in Appendix 1. The exemption is different for PIMW. PIMW operators who are not commercial haulers may transport PIMW without a permit if they transport less than 50 pounds at one time or they are transporting their own waste between two sites that they own.

In addition to the permit requirements, are there any other kinds of regulations of which I should be aware?

There is a hierarchy of wastes dependent upon their potential to harm people or the environment. Generators and receivers of the wastes must comply with all the regulations specific to their category plus those applicable to less dangerous wastes.

Nonspecial wastes are regulated under the solid waste rules found in 35 Ill. Adm. Code 807 through 815. Portions of these regulations also pertain to all special waste. In some instances, the generator can certify that certain industrial process wastes or pollution control wastes are not special waste. More information on this certification process may be found in the Illinois Environmental Protection Act.

Hazardous wastes are also regulated under the federal rules resulting from the Resource Conservation and Recovery Act. The RCRA rules have been made a part of the state's rules and can be found in 35 Ill.

Adm. Code 700 through 739. The hazardous waste rules are very complicated and contain many specific inclusions, exclusions and exemptions. A guidance document on understanding the hazardous waste rules is available from the Bureau of Land at (217) 782-6762. This guidance document includes a helpful discussion of how you can determine the classification of your waste.

Whom should I contact for further information?

If the previous information indicates that you may need a permit, you should contact the Bureau of Land's Permit Section at (217) 524-3300. Different types of permits are issued by different units. To help you get to the appropriate person to answer your questions, we have identified the units that review each type of application or permit previously discussed.

Non Hazardous Waste Disposal:	Solid Waste Unit
Treatment - Storage and Transfer:	Disposal Alternatives Unit
Hazardous Waste Disposal and On-Site Storage:	RCRA Unit

When calling, you should ask to speak to a permit reviewer in the Unit which you anticipate will be involved with your operation.

Questions about special waste hauler licenses and manifests should be directed to the Solid Waste Management Section at (217) 785-8604.

(Exhibit B1)

Rev.Adv.Mater.Sci. 17(2008) 42-61

UTILIZATION OF HAZARDOUS WASTES AND BY-PRODUCTS AS A GREEN CONCRETE MATERIAL THROUGH S/S PROCESS: A REVIEW

Smita Badur and Rubina Chaudhary

School of Energy and Environmental Studies, Devi Ahilya University, Takshashila Campus, Khandwa Road, Indore-452001, M.P., India

Recieved: January 08, 2008

Abstract. The disposal and treatment of hazardous industrial waste is very costly affairs for the industries, it has been a dormant issue. The new millennium brings challenges for the civil and environmental engineers and opportunities for research on the utilization of the solid waste and by-products and basic properties of concrete and its materials. The recycling of waste and by-products attracts an increasing interest worldwide due to the high environmental impact of the cement and concrete industries. Normal concrete is manufactured using sand and stones, but lightweight concrete can be made by using industrial by-products and hazardous solid wastes such as expanded fly ash, slag, sludge, *etc.* The Best Demonstrated Available Technology (BDAT) stabilization/solidification (S/S) can be used for treatment of concrete contaminated solid hazardous wastes and by-products. The performance of concrete is measured in terms of physical, engineering, and chemical properties.

The review describes how chemical and mineral admixtures help in the improvement of the lightweight concrete properties. Cement is replaced by the 15-35% fly ash in the concrete mix. Fly ash increases concrete strength, improves sulfate resistance, decreases permeability, reduces the water ratio required, and improves the workability of the concrete. Partial substitution solid hazardous waste does not strongly affect the strength of concrete and other properties. This mixed lightweight concrete is safe enough to be used in sustainable environmental applications, like roadbeds, filling materials, *etc.*

1. INTRODUCTION

Due to environmental degradation, high energy consumption, and financial constraints, various organizations in India and abroad, as well as United States Environmental Protection Agency (USEPA) have recommended various qualitative guidelines for generation, treatment, transport, handling, disposal, and recycling of non-hazardous and hazardous wastes [1–4]. It is now a global concern, to find a social, techno-economic, environmental friendly solution to sustain a cleaner and greener environment. The environmental technology, disposal and treatment of hazardous industrial waste has been a dormant issue that has recently been activated by the passage of the Resource Conservation and Recovery Act (RCRA) [5]. Already accumulated solid wastes and increasing annual production are a major source of pollution.

In different countries, some of such wastes are used for landfilling abandoned quarries and mines and adopting alternative method. The hazardous solids and sludges require a secure chemical landfill. Research has been conducted to recycle valuable material and reduce the volume of hazardous solid waste and other pollutants, which is harmful for living organisms. For the industries, disposal of sludge is very costly method, due to long-distance transportation and the use of illegal or question-

Corresponding author: Rubina Chaudhary, e-mail: rubina_chaudhary@yahoo.com

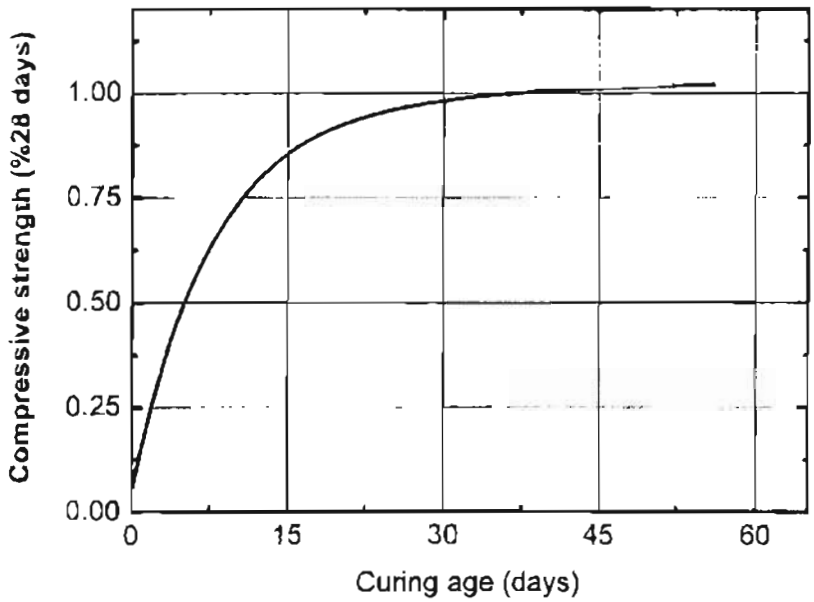


Fig. 3. Concrete strength as a function of the water to cement ratio. Data from [23].

3. UTILIZATION OF HAZARDOUS SOLID WASTE AND BY-PRODUCTS

In developing and industrial countries, large amounts of industrial waste or by-products are accumulated every year. Recycling of these materials is of increasing interest worldwide, due to the high environmental impact of the cement and concrete industries [47]. For the production of cement and concrete, very high amount of energy is needed. About 7% CO_2 is released to atmosphere during cement production. It has negative influence on ecology and future of human being [11,12]. According to industrial ecology concept for sustainable development, by-product of one industry may be a raw material for other industry. Therefore, detrimental effects of both industries to the environment can be reduced. Harmful effects of concrete on the environment can be reduced by producing durable concrete and effective usage of resources. Industrial by-products and solid wastes can be used for this purpose [11,48]. For this reason, cost, durability and environmental friendliness are important criteria used in developing concrete technologies [49].

Concrete elements containing industrial by-products or solid wastes as aggregate replacement should be investigated with regard to these degradation causes, mechanical properties, and microstructure [50].

Normal concrete is made using sand and stones, but lightweight concrete can be made using industrial by-products such as expanded slag, clay, and sludge as aggregates. It is more difficult to achieve high strength with weaker aggregate [21,25].

3.1. By-products

Industrial by-product (class F - fly ash, slag) can be used in large amount as replacement material of cement in concrete. It can be added in a quantity of 10% to about 35% by weight of cement. It will be very beneficial in reducing CO_2 emission during production of cement, preventing the global warming [11,12]. The cement companies have the necessary expertise to mix suitable quantity of fly ash in Portland cement and blend properly [10]; fly ash should never be added at site. Fly ash can help with our solid waste problems, and it reduces overall energy use. While fly ash is sometimes used as a source of silica in cement production, a more common use is in concrete mixture as a substitute

for some of the cement. Fly ash, or pozzolan, can readily be substituted for 15% to 35% of the cement in concrete mixes, according to the U.S.EPA [2] (Environmental Protection Agency). For some applications, fly ash content can be up to 70%. Thus, fly ash today accounts for about 9% of the cement mix in concrete. Water absorption, coefficient of water and chloride diffusion co-efficient was less in fly ash concrete [51].

If the class C fly ash is used in the concrete mix higher replacement level is possible. If the replacement level is more then 25%, it shows marginal reduction in the strength [52,53]. The grinding of fly ash influences the strength development in concrete [42,43]. As with the Class C fly ash, the Class F fly ash is also composed primarily of an amorphous phase and some crystalline components that include alpha-quartz, Fe_3O_4, Al_2SiO_5, $(Mg,Fe)_2SiO_4$, and CaO. The main difference was that Class F fly ash contains no reactive crystalline reactive component such as C_3A. The acid-insoluble residue (89%) of the fly ash consisted virtually of the same phases detected before treatment except for CaO [28]:

$$P = f / (c + f),$$

where, P is the percentage of fly ash, f = fly ash content in kg, c = cement content in kg [10].

The use of fly ash in concrete is the highest-volume application for fly ash. Concrete requires less water when fly ash is used in place of cement, resulting in less shrinkage and cracking [53]. According to U.S.EPA, 15% is a more accepted rate when coal fly ash is used as a partial cement replacement as an admixture in concrete [2,54].

C. Natarajan reported M20 and M30 grade of concrete mixes having different replacement level of cement with low calcium fly ash [10]. Compressive strength (Rc) values at 3-28 days curing period shows a fine relationship between Rc value and the logarithm curing time for fly ash/cement mortar at different temperature [42].

C. D. Ati [53] carried out laboratory scale study concrete mixtures were prepared by the replacement of 50 and 70% of cement with fly ash. The range of water to cement ratio was from 0.28 to 0.34. The concrete mixture was cured at temperature of 20 °C at 65% relative humidity. It was concluded that fly ash concrete showed higher strength after 28 days. The efficiency factor K was defined as the ratio of the mass of cement to the mass of the fly ash when they had equivalent effect on the water to cement ratio [55].

$$X = \frac{W}{C + KF + S},$$

where, X is the water to cement ratio, W - water content, C - cement content, F - fly ash content, S - GBFS content, and K is the efficiency factor.

The cement efficiency factor of fly ash with respect to water tightness or water permeability which is approximately 0.3. There is no effect of cement type and curing time. Efficiency factor has some effect on concrete strength formula and it is dependent on curing days and percent of replacement [55,56]. Curing temperature is important factor increase in curing temperature yielded in compressive strength for fly ash replacing percentages [42,57].

Fly ash reacts with free lime after the hydration to form calcium silicate hydrate, which is similar to the tricalcium and dicalcium silicates formed in cement curing. Through this process, fly ash increases concrete strength, improves sulfate resistance, decreases permeability, reduces the water ratio required, and improves the workability of the concrete. Fly ash with low sulfur and carbon contain is better for concrete.

There are at least a dozen companies providing fly ash to concrete producers. Other industrial waste products, including blast furnace slag, cinders, and mill scale are sometimes substituted for some of the aggregate in concrete mixes [58]. Fly ash can be introduced in concrete directly, as a separate ingredient at the concrete batch plant or, can be blended with the ordinary portland cement (OPC) to produce blended cement, usually called portland pozzolana cement (PPC) in India. Fly ash blended cements are produced by several cement companies worldwide [21].

3.2. Waste materials

Research have investigated various properties of concrete containing by-products and waste materials such as Granulated Blast-Furnace Slag GBFS), Fly Ash (FA), Bottom Ash (BA), Silica Fume, Waste Glass (WG) as mineral admixture, aggregate replacement or binding material [59].

Study on possible usage of BA and GBFS in production of plain concrete elements was performed. It was reported that replacement of BA decreases the unit weight of briquette. Usage of BA makes feasible up to 30% partial replacement of aggregate in production of briquettes. As GBFS/Sand ratio increases in paving blocks, water ab-

(Exhibit B)

Derenzo and Associates, Inc.
Environmental Consultants

AIR QUALITY IMPACTS FOR TOUGHCUTS CONCRETE SERVICES, INC. NONMETALLIC MINERAL CRUSHING AND PROCESSING EQUIPMENT AT SEXTON DEVELOPMENT

1.0 PURPOSE

Derenzo and Associates Inc. (Derenzo and Associates) has prepared this document to present the results of air pollutant emission regulatory compliance analyses that were performed to evaluate nonmetallic mineral (waste concrete) crushing and processing equipment planned for operation by ToughCuts Concrete Services, Inc. (ToughCuts Concrete Services) at Sexton Development in Richton Park on approximately 80 acres of land located west of Interstate 57 and north of Sauk Trail.

2.0 EQUIPMENT AND PROCESS OPERATIONS

The planned waste concrete crushing and processing equipment will be operated:

1. At the western edge of the specified site, which provides the furthest distance from the closest residences, for a period of approximately three years; and

2. During the hours of 8:00 AM to 5:00 PM Monday through Friday.

ToughCuts Concrete Services plans to operate at the specified site the following equipment a:

1. Fintec F1107 mobile jaw crusher;

2. Thunderbird Kobelco 4230 portable jaw crushing plant;

3. Pioneer 54X25 triple roll crusher;

4. 1997 Viper 301 portable screening plant;

5. Backhoe loader (on tracks);

6. Front end loader (on tires);

(Exhibit B)

7. Tanker truck for the application of water to appropriate roadways and materials storage piles; and

8. Sweeper vehicle to maintain paved vehicle traffic roads (appropriate on site and off site areas).

The specified equipment will be used to handle / move concrete materials, reduce and size pieces of waste concrete, and control airborne emissions of particulates (dust). A majority of the processed materials will be stored in piles and sold to customers for use in construction projects. A small amount of the processed materials will be retained onsite for future development purposes. Waste pieces of concrete (from demolition projects) are delivered to the site where it is stored and subsequently processed at appropriate times.

The crushers and screens will process up to approximately 80 tons of material per hour (TpH) of operation. While ToughCuts Concrete Services plans to place three crushers at the waste concrete processing site no more than two crushers (which will be operated in series) will ever be used at the same time.

A total of approximately 250,000 tons of waste concrete material will be processed at the site annually (TpY).

A single backhoe loader will be used to move waste concrete (from storage piles) to the crusher(s).

A single front-end loader will be used to remove processed material (final product) for customer load-out activities.

The planned crushing and screening operations are equipped with water sprays to control particulate emissions that are generated from the specified material reduction and sizing operations.

Site paved and unpaved roadways will be swept and watered (unpaved roads will not be swept) as often as necessary to minimize dust emissions from vehicle traffic.

Material stockpiles will be watered as necessary to minimize dust emissions from erosion and load-out operations.

The drop distance for all material transfer points will be reduced to the minimum that can be achieved for proper equipment operations.

Trucks will be loaded to appropriate heights that do not exceed the top of the container sideboard or tarped in order to prevent load materials from escaping.

Material spillage on local roadways will be cleaned immediately.

The specified control measures are expected to reduce uncontrolled particulate and dust emissions at the planned waste concrete crushing and processing operations by at least 80%. The waste concrete crushing and processing equipment will be operated so that the distance to the nearest residence, or commercial establishment or place of public assembly is greater than 1,320 feet (one quarter mile).

2.0 AIR POLLUTANT EMISSIONS

2.1 Particulate Emissions

Emissions of particulate matter are the main air pollutant that is produced by the operation of nonmetallic mineral crushing and processing facilities. Material crushing and processing plants typically have many pieces of equipment that have the potential to emit particulates. Most of these sources are referred to as fugitive emissions, which are difficult to quantify (i.e., they are not exhausted through a stack that provides ventilation to a piece of equipment or process; they are produced by open processes such as truck and loader traffic on paved and unpaved roads).

The USEPA has developed emission factors that are presented in a *Compilation of Air Pollutant Emission factors Volume I: Stationary Point and Area Sources* (AP-42) that numerous state regulatory agencies (including the Illinois EPA) rely on to estimate the amount of particulate matter that will be emitted from the operation of waste concrete crushing and processing facilities.

Based on the use of the AP-42 emission factors, the specified maximum material processing rates and minimum control efficiency of 80%, the planned waste concrete crushing and processing equipment is estimated to have maximum particulate matter (PM-10, particulates with diameters that are less than 10 microns for which USEPA promulgated National Ambient Air Quality Standards, NAAAQS) emissions rates of 2.4 pounds per hour (lb/hr) and 3.75 TpY. USEPA has promulgated NAAQS for PM-2.5 (particulates with diameters that are less than 2.5 microns). Emissions of these smaller particulates (based on the nature of the specified operations and information presented in AP-42) are estimated to be much smaller than those presented for PM-10.

2.2 Gaseous Emissions

Power generation equipment associated with nonmetallic mineral crushing and processing operations has the potential to produce gaseous emission (e.g., carbon monoxide, sulfur dioxide, volatile organic compounds, nitrogen oxides, particulates). However, the magnitude of these emissions has been determined by the Illinois EPA to be insignificant. Construction or operating permits are not required for stationary internal combustion engines that have

(Exhibit C1)

bottom ash, fly ash and combined bottom and fly ash, but excluding recovered metals, glass, and other recovered materials separated from the ash residue.

(a) "Bottom ash" means the solid material remaining after combustion of solid waste, which is discharged from the grates or stoker of a solid waste combustor.

(b) "Fly ash" means the residue from the combustion of solid waste, which is entrained in the gas stream of a solid waste combustor. Fly ash includes particulates, cinders, soot, and solid waste from air pollution control equipment.

(8) "Biomedical waste" has the meaning given it in Chapter 64E-16, F.A.C.

(9) "Biological waste" means solid waste that causes or has the capability of causing disease or infection and includes biomedical waste, animals that died from disease, and other wastes capable of transmitting pathogens to humans or animals. The term does not include human remains that are disposed of by persons licensed under Chapter 470, F.S.

(10) "Bird hazard" means an increase in the likelihood of bird/aircraft collisions that may cause damage to the aircraft or injury to its occupants.

(11) "CCA treated wood" means lumber, timber, or plywood treated with chromated copper arsenate. This term does not include utility poles unless they have been ground, chipped, or shredded.

(12) "Cell" means a volume of solid waste received since the last previous application of initial cover. The compacted waste and subsequent initial cover constitute a cell that usually contains wastes deposited in one day.

(13) "Class I waste" means solid waste that is not hazardous waste, and that is not prohibited from disposal in a lined landfill under Rule 62-701.300, F.A.C.

(14) "Class III waste" means yard trash, construction and demolition debris, processed tires, asbestos, carpet, cardboard, paper, glass, plastic, furniture other than appliances, or other materials approved by the Department, that are not expected to produce leachate that poses a threat to public health or the environment.

(15) "Clean debris" means any solid waste that is virtually inert, is not a pollution threat to ground water or surface waters, is not a fire hazard, and is likely to retain its physical and chemical structure under expected conditions of disposal or use. The term includes brick, glass, ceramics, and uncontaminated concrete including embedded pipe or steel.

(16) "Clean wood" means wood, including lumber, tree and shrub trunks, branches, and limbs, which is free of paint, glue, filler, penthachlorophenol, creosote, tar, asphalt, chromated copper arsenate, other wood preservatives or treatments.

(17) "Closing" means the time at which a solid waste management facility ceases to accept wastes, and includes those actions taken by the owner or operator of the facility to prepare the facility for any necessary monitoring and maintenance after closing.

(18) "Closure" means the cessation of operation of a solid waste management facility and the act of securing such a facility so that it will pose no significant threat to

VILLAGE OF RICHTON PARK
Planning & Zoning Commission
June 14, 2011

CALL TO ORDER

Chairman Pluth called the meeting to order at 7:38 p.m. Roll call was taken and a quorum was established.

ROLL CALL

Present: Commissioners Canady, McDonald, Marsh, and Chairman Pluth

Also present: Village Manager De'Carlon Seewood, Community Development Director Regan Stockstell, Economic Development Interns Michelle Joseph and Eduardo Proenza, Todd and Drew Daniels from Sexton Properties, and residents Anthony Jones, Tommie and Gaylon Garner, Jerry Rials, Denise Washington, and Karen Long

NEW BUSINESS

PC 2011-09
Public Hearing — The public hearing was opened at 7:40 p.m. - Consideration of a Special Use Petition to allow a concrete crushing operation

In May of 2005 the Village of Richton Park Board of Trustees approved Ordinance No. 1219 authorizing a special use permit for concrete crushing operation as it related to site improvements at the John Sexton Sand and Gravel Co. property located at the northeast corner of Sauk Trail and Central Avenue.

As stipulation in Section 14.06(I) Termination of Special Use Permit in the village zoning ordinance, the petitioner must begin the proposed work within three (3) years of the approved permit. Sexton has resubmitted their petition and is seeking approval or re-establishment of the special use permit, with changes in the conditions referenced in the 2005 ordinance. The public hearing notice concerning this matter was published in the Sunday, May 29th edition of the Southtown Star newspaper. Courtesy notices were also mailed to residents in the North Lakewood and Meadow Lakes neighborhoods.

Per Todd Sexton, the company would like to secure the services of Tough Cuts, a sub-contracted concrete crushing operator who presently works with IDOT and other companies. The changes the proposed by the company include:

(a) monthly operations reports to the village versus the present quarterly reports
(b) Changes in the hours of operation to a 7:00 a.m. start time Monday through Friday (presently 8:00 a.m.), and the addition of Saturday hours from 8:00 a.m. to 4:00 p.m.
(c) Adding the ability to allow Tough Cuts to take away/use amounts of the crushed aggregate at other sites under the condition that they replace the amounts removed with a premium of additional aggregate.

(Exhibit C)

Chairman Pluth inquired about consequences in the event Tough Cuts failed to meet the requirements set by their agreement. Mr. Sexton responded that restitution would either be in the form of monetary compensation or the use of Tough Cut's machinery at no cost to perform crushing operations on the company's own behalf...

Resident Denise Washington, President of the Meadow Lake Homeowners Association, 22053 Neptune, expressed concern about the possible reduction of air quality and increase of noise associated with adding a crushing operation. This noise would be added to the current noise of I-57 and the railroad. She also asked if traffic on Sauk Trail would be affected by these additional operations.

Drew Sexton replied that there should be no appreciable change in noise, traffic, or air quality. He further stated that Saturday operations would mostly be make-up work and should not equal any regular weekday amount. There will be three crushers and one dozer or compactor added to the site.

Ms. Washington asked about any impact on stormwater and whether there would be employment or any economic benefit for residents. Mr. Sexton responded that the company has conducted many costly inspections to get to the point it is today. There should be no negative impact with regard to stormwater. There may be a potential host fee associated with operations but that fee, if approved, is still to be determined.

10-year resident Anthony Jones, 22060 Scott Drive, also expressed his concern about increased noise being added to that of the trains, traffic on I-57. He does not believe additional noise can be contained and would like to see the company undertake the crushing operation elsewhere. He asked the commission to deny the permit.

Resident Gaylon Garner, 22023 Sunset Drive, agreed with Mr. Jones and Ms. Washington regarding the noise and flooding, and also expressed concern about possible soil contamination.

Todd responded that the EPA and their in-house experts conduct regular tests to make certain that contamination is not a factor in every load brought to the site.

Resident Jerry Rials asked about plans for the section east of I-57. That parcel presently a tree nursery currently zoned M3. The full-grown trees will be used for future construction development on the west side of I-57. The potential benefit to nearby homeowners would be more retail and another entity such as a recreational center.

Mr. Stockstell provided another perspective for residents to consider: development would mean the land could be used for retail or office space, versus an industrial use that would be possible under the current zoning.

Resident Karen Long, 22012 Scott Drive has only been a resident for four months but would like to request that Saturday hours be limited to 4 hours. Outside of that, she is in favor of allowing the petition.

The public hearing was closed at 9:12 p.m.

Commissioner Canady asked if Tough Cuts was located in Frankfort and whether there was information on any long term effects related to noise pollution. Todd Sexton replied that noise should not be a factor to any resident more than 50 feet away from the site. Material taken away will be used by Tuff Cuts at other sites needing ready, crushed material on short notice, to be returned in a timely manner.

Chairman Pluth explained the future hardship on nearby residents is an unknown and he is uncomfortable with the unknown. Todd explained that should any of the perceived hardships become reality, Sexton could (a) change hours of operation or (b) erect earth berms to deflect sound.

Staff stated that the findings of fact to approve the special use permit were met as indicated below:

(a) the establishment, maintenance, or operation of the special use will not be unreasonably detrimental to or endanger the public health, safety, morals, comfort or general welfare
(b) The special use will not be injurious to the use and enjoyment of other property in the immediate vicinity for the purposes already permitted, nor substantially diminish and impair property values within the neighborhood;
(c) The establishment of the special use will not impede the normal and orderly development and improvement of surrounding property for uses permitted in the district;
(d) Adequate utilities, access roads, drainage and/or other necessary facilities have been or are being provided
(e) Adequate measures have been or will be taken to provide ingress and egress so designed as to minimize traffic congestion in the public streets; and
(f) The special use shall in all other respect confirm to the applicable regulations of the district in which it is located, except as such regulations may in each instance be modified by the village board pursuant to the recommendations of the plan commission.

A motion to approve the petition with conditions that hours remain 8 a.m. to 5:00 p.m., no Saturday hours, and reports to include an estimated time frame for completion was made by Commissioner Marsh and seconded by Commissioner McDonald.

The vote:

Commissioner Canady	Aye
Commissioner McDonald	Aye
Commissioner Marsh	Aye
Chairman Pluth	Aye

PC 2011-08
Public Hearing — The public hearing was opened at 9:54 p.m. – Consideration of a zoning text amendment to Section 9.00 Business Districts of the Village Zoning Ordinance as it relates to the establishment of exterior material and construction requirements.

In 2003 the village adopted ordinance number 1152 establishing exterior material and construction requirements for new construction in the village's four residential zoning districts. At that time, no consideration was given to exterior requirements for new commercial buildings.

Staff's recommendation will require modifications to Sections 9.03, 9.04, 9.05, and 9.06 of the Village Zoning Ordinance establishing exterior masonry and construction requirements for each commercial zoning classification. Staff's recommendation would add one sub-section to each of the four residential classifications. Changes will impact the B1, B2, B3, and B4 districts. Staff will come back at a later time to recommend changes to some residential districts.

A PowerPoint presentation by Intern Eduardo Proenza was provided to all Commissioners.

The public hearing was closed at 10:00 p.m. A motion to accept staff's recommendation to amend Section 9.00 Business Districts zoning ordinance was made by Commissioner Canady and seconded by Commissioner Marsh.

The vote:

Commissioner Canady	Aye
Commissioner McDonald	Aye
Commissioner Marsh	Aye
Chairman Pluth	Aye

A motion to approve the minutes of May 3, 2011 was made and a vote taken.

The vote:

Commissioner Canady	Aye
Commissioner McDonald	Aye
Commissioner Marsh	Aye
Chairman Pluth	Aye

ADMINISTRATIVE REPORT

Mr. Stockstell advised the commissioners that Abe Lentner, former Economic Development Director, had left the employ of the village as of June 9th and informed them that the deadline for applying for the position is July 27th.

He asked the commissioners to check out the Sauk Trail streetscape project currently underway. Large murals will become part of the improvement and the project should be completed by the end of July.

The HVAC units were replaced at village hall courtesy of a Cook County Energy Efficiency Community Block Grant.

There will be a staff meeting with contractors regarding the NSP program for the Richton Hills and Lioncrest subdivisions. Staff has acquired five homes for the NSP program that will be rehabbed and resold to pre-qualified buyers

In Phase III of the NSP program there is $5 million dollars allotted for the acquisition of more targeted homes. This time staff will seek funding for the demolition and rebuilding of the homes because demolition is more cost effective than renovating and retrofitting.

The next meeting is scheduled for June 28, 2011. Staff will discuss guidelines for residential building.

A motion to adjourn at 10:22 p.m. was made by Commissioner McDonald and seconded by Commissioner Marsh.

Respectfully submitted,

Ouida Drummond-Neal
Recording Secretary

(Exhibit D1)

Does My Business Need An Air Pollution Control Permit?

State Construction Permits

Does My Business Need a Construction Permit?

For a new business or a new emission source, you can determine whether your business needs a construction permit by going through Steps 1 and 2. For an existing emission source, you will also need to look at Steps 3 and 4 below to determine whether your existing source has been modified so as to require a construction permit. For an existing emission source, you should be aware that even if you did not obtain a construction permit prior to the construction of your emission source, you may be required to obtain an operating permit. The Agency recommends that you determine whether you need an operating permit (see the Operating Permit Section on page 8) and apply for an operating permit regardless of whether you obtained a construction permit.

Step 1 — Does my business have an emission source?

You should first ask whether your business has an emission source or air pollution control equipment as defined in the state air pollution control regulations. The definition of an emission source is very broad and includes almost any industrial or process equipment.

- **Emission source** - An emission source is defined as any equipment or facility of a type capable of emitting specified air contaminants to the atmosphere. (See Appendix 1 for specified air contaminants.)
- **Air pollution control equipment** - Air pollution control equipment is defined as any equipment or facility of a type intended to eliminate, prevent, reduce or control the emission of specified air contaminants to the atmosphere.

Three important considerations:

1. If your business does not have an emission source, you are not required to obtain an air pollution control construction permit.
2. If your business has air pollution control equipment, it has an emission source.
3. If your business does have an emission source, proceed to Step 2.

Step 2 -- Does my emission source fit within any of the exemptions from the state permit requirements?

The environmental regulations for air pollution contain a list of emission sources and associated air pollution control equipment for which you are not required to obtain a construction permit. Most of these are small emission sources, many of which are located at small businesses. A complete list of current exemptions from air permit requirement contained in the state air pollution control regulations can be found at www.ipcb.state.il.us under Title 35: Subtitle B, Chapter I, Section 201.146.

Two important considerations:

If your emission source does not fit within one of the permit exemptions, you are required to obtain an air pollution control construction permit from the Bureau of Air prior to construction of the emission source.

If your emission source does fit within one of more of the exemptions, you are not required to obtain a

state air pollution control construction permit. If it is not clear whether an emission source qualifies for exemption or if a written determination is desired from the Agency, a letter of inquiry can be submitted.

You should be aware that even if you do not need a permit, there may be certification, control requirements or record keeping requirements with which you must comply. Any application for a new operating permit or for revision to an existing operating permit should contain information on all emission sources, regardless of whether or not they are exempted.

Also, Potential to Emit (PTE) calculations should be submitted for all emission sources, exempt or not. These are required to enable the permit analyst to properly determine the type of operating permit required. A request can be made for exemption of those emission sources thought to qualify.

Step 3 — For an existing emission source, have you made any modifications that trigger the construction permit requirement?

- **Modification:** A modification is defined as any physical change, or change in the method of operations, of an emission source or of air pollution control equipment which increases the amount of any specified air contaminant emitted by such source or equipment or which results in the emission of any specified air contaminant not previously emitted. It shall be presumed that an increase in the use of raw materials, the time of operation or the rate of production will change the amount of any specified air contaminant emitted. Notwithstanding any other provisions of this definition, for purposes of permits issued pursuant to Subpart D, the Illinois Environmental Protection Agency (Agency) may specify conditions under which an emission source or air pollution control equipment may be operated without causing a modification as herein defined. Normal cyclical variations, before the date operating permits are required, shall not be considered modifications.

There is a significant amount of historical interpretation of this definition (35 Ill. Adm. Code §201.102). In some situations, the interpretation can be quite complex. However, under the air regulations, any physical change in an emission source that increases emissions will generally require a construction permit. A physical relocation of an emission source or unit without necessarily increasing emissions will also require a construction permit unless specifically excluded according to the portable emission unit regulations (35 Ill. Adm. Code §201.170).

You may wish to discuss these issues with someone from the Bureau of Air's Permit Section or obtain professional assistance or both in making this determination.

Step 4 — If new equipment or modifications cause increased emissions that are at a major source level, are any other regulations triggered?

- **Major source:** A major source is defined as any stationary source (or any group of stationary sources that are located on one or more contiguous or adjacent properties, and are under common control of the same person or persons) belonging to a single major industrial grouping and is described in one of the following:

{Potential to emit (PTE) is defined as the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design after any required reduction by air pollution control devices. Note that this is calculated considering the maximum capacity of the equipment (use 8760 operating hours per year).}

- PTE 250 tons per year (TPY) or more of any air pollutant, i.e., particulate matter (PM-10), sulfur dioxide (SO2), nitrogen oxides (NOx), carbon monoxide (CO), or volatile organic material (VOM), including volatile organic compounds (VOC).
- PTE 100 TPY for certain industry classifications.
- PTE 100 TPY or more of VOM or NOx in the metropolitan Chicago ozone nonattainment area, and the Metro East St. Louis nonattainment area. However, current litigation may revert the Chicago ozone nonattainment area to 25 TPY, the level prior to redesignation as a moderate nonattainment area.
- PTE 10 TPY or more of any one of the 188 Hazardous Air Pollutants (HAPs) listed pursuant to

section 112(b) of the Clean Air Act, or
- PTE 25 TPY of any combination of HAPs, the Prevention of Significant Deterioration of air quality (PSD) and New Source Review (NSR) requirements also state that the owner or operator of all subject sources complete an air quality analysis of ambient air quality in the source's area.

The PSD and NSR requirements also state that the owner or operator of all subject sources must complete an air quality analysis of ambient air quality in the source's area. The PTE of your business and the area of the state in which your business is located determine whether NSR or PSD requirements apply.

If the emissions exceed the major source level, then the piece of equipment or modification may need to comply with federal regulations for PSD (40 CFR 52.21) and 35 Ill. Adm. Code 203, New Source Review (NSR). Under the PSD requirements, the owner or operator of all subject sources are required to apply the best available control technology (BACT) for each pollutant for which the source emits a large enough amount to classify the source as a major source for that pollutant, while under NSR requirements, the owner or operator is required to apply the lowest achievable emission rate (LAER).

If your emissions are close to or at a major source level, then consultation with a permit analyst is recommended before application is submitted to determine applicability of these rules.

State Operating Permit

Does My Business Need an Operating Permit?

Determining whether your business needs an air pollution control operating permit is nearly identical to determining whether your business needs a construction permit. However, you should pay special attention to the explanation of the federal Clean Air Act Permit Program (CAAPP) requirements below, since they do not always follow the same steps. There are also different kinds of operating permits of which you need to be aware.

1. Will you need an air pollution operating permit for your emission source?

- If your emission source or air pollution control equipment does not need an air construction permit (as determined from Steps 1 and 2 of the earlier section of this document), it does not need an operating permit. (But see Note below.)
- If your emission source or air pollution control equipment requires a construction permit, it will also need an operating permit. Some qualifying portable emission units do not require construction permits when moving to a new location, but still require an operating permit with other special requirements. For more information on how an emission unit can qualify under the portable emission unit regulations refer to 35 Ill. Adm. Code § 201.170 which can be found under Subtitle B: Air Pollution at the Illinois Pollution Control Board web site.

Note: In a limited number of circumstances, the requirement for a CAAPP permit may still apply even if your emission source fits within one of the exemptions. For example, certain businesses subject to the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) are exempt from the state operating permit requirements (e.g., certain dry cleaners); however, they may emit a level of hazardous air pollutant (HAP) emissions, which triggers a CAAPP permit requirement (See Appendix 1). Similarly, certain engines exempt from the state operating permit requirement may emit enough nitrogen oxides to trigger the CAAPP permit requirement.

2. What Type of Operating Permit Is Required?

If you have determined that you need an operating permit for your business, you will want to know the type of operating permit you need. This will determine the application requirements you must meet, the application forms you should use, and the permit you will receive. The Bureau of Air's Permit Section, at (217) 782-2113, will help you if you need assistance.

A brief description of the different kinds of operating permits follows below. As with the previous steps,

VILLAGE OF RICHTON PARK

ORDINANCE NO. 1497

AN ORDINANCE APPROVING A SPECIAL USE PERMIT TO ALLOW A CONCRETE CRUSHING OPERATION
(SEXTON PROPERTIES R.P., LLC/CRUSHING OPERATION)

WHEREAS, pursuant to Ordinance No. 1219 previously approved by the President and Board of Trustees, the owner of the property identified therein, commonly referred to as the "Sexton Property" received a special use permit to allow for certain concrete crushing operations to take place at said property; and

WHEREAS, the special use approved by Ordinance No. 1219 required petitioner to commence the proposed work with three years of the date of the Ordinance; and

WHEREAS, no such work commenced within the allotted three years; and

WHEREAS, the owner of the Subject Property has requested that the special use permit be reissued and has further requested that some of the conditions set forth in said permit be modified; and

WHEREAS, pursuant to notice as required by the law the Village Planning and Zoning Commission conducted a public hearing on this proposal and has favorably recommended it; and

WHEREAS, the President and Board of Trustees have determined that re-issuing the special use permit and modifying certain conditions therein will be reasonable and will benefit the Village's long term goal of assisting in the redevelopment of the Subject Property;

(Exhibit D)

NOW THEREFORE, BE IT ORDAINED BY THE PRESIDENT AND BOARD OF TRUSTEES OF THE VILLAGE OF RICHTON PARK, COOK COUNTY, ILLINOIS, as follows:

Section 1: Special Use Permit Extended. The special use permit previously issued by Ordinance No. 1219 is hereby re-issued and extended to allow work to begin pursuant to said permit on or before June 1, 2013.

Section 2: *Modification of Certain Conditions in Ordinance 1219.*

Notwithstanding anything to the contrary provided in Ordinance No. 1219:

A. Developer must provide Village with monthly reports of materials brought to the site and from where the materials originated.

B. Hours of operation shall be from 8:00 a.m.-5:00 p.m. Monday through Friday ("Hours of Operation").

C. Any aggregate amounts currently located on the site shall remain on the site. New aggregate entering the site after the contractor commences to operate shall be processed and exit the site as part of such concrete crushing operation.

Section 3: Special Environmental and Nuisance Abatement Conditions. The special use permit is subject to the following additional environmental and nuisance abatement conditions:

A. The time-average A-weighted sound level (also known as the equivalent-continuous sound level or Leq) of the crushing operation shall be no more than five (5) decibels greater than the time-average A-weighted sound level of the ambient noise during the Hours of Operation when measured from the eastern boundary of the tree farm located immediately west of the Lakewood North subdivision. Measurement procedures shall be based on ANSI Standard S12.9/Part 3, "Quantities and Procedures for Description and Measurement of Environmental Sound. Part 3: Short-term measurements with an observer present." In order to enforce this condition:

(i) At the request of the Village and at the Developer's expense, Developer shall cause an independent qualified third party to take decibel measurements during Hours of Operation in order to determine whether this condition is being violated;

(ii) In the event the measurements indicate a violation of this condition, then Developer shall immediately require its contractor to modify its operations to prevent further violation of this condition; and

(iii) In the event a violation continues in excess of seven (7) consecutive days, then the Village may revoke the special use permit so granted.

B. Developer shall require its contractor to control operations so that dust or other particulate matter being generated from work performed on the Subject Property does not interfere with the quiet use and enjoyment of any residential property within the Village. To that end:

(i) Developer shall require its contractor to utilize dust control/dust suppression technologies in order to prevent dust and other particulate matter from reaching residential property in the Village. Such technology shall include, but not be limited to, full-time water application controls;

(ii) Prior to commencement of operations, Developer and its contractor shall meet with Village staff to identify dust control operations which will be utilized;

(iii) Prior to commencement of operations, Developer shall install monitoring equipment on Developer's tree farm referred to in Section 3A. The monitoring equipment shall be operational on a 24-hour/7-day a week basis. The monitoring equipment shall measure any potential impact of operations as measured from the closest residential property to the tree farm. The purpose of the monitoring is to ensure compliance with generally accepted national standards for safe particulate exposures (PM-10 National Ambient Air Quality Standards).

Should the equipment fail to operate or otherwise experience functional difficulties, Developer shall repair the equipment as soon as possible, but in no case later than seven (7) days from the malfunction. In the event the equipment is not repaired within seven (7) consecutive days of the malfunction, crushing operations shall cease until such time as the equipment is once again operational.

At the request of the Village, Developer will make the monitoring results and records available for inspection and review, for purposes of demonstrating that there are no adverse impacts from the crushing operations.

(iv) In the event the Village receives any complaints from neighbors regarding potential dust or other particulate matter from the Subject Property interfering with the quiet use and enjoyment of the neighboring residential

properties, then Developer and contractor shall meet with the Village Manager to review the complaints. At the direction of the Village Manager, Developer and contractor shall immediately prepare and submit a remediation plan to the Village in order to address the complaints and alleviate any dust or particulate matters from blowing onto neighboring residential properties; and

(v) Developer's failure to respond and develop a remediation plan as provided for hereinabove shall constitute cause to revoke the special use permit.

Section 4: Effective Date. This Ordinance shall be in full force and effect upon its passage, approval, and publication as required by law.

PASSED AND APPROVED this 25th day of July, 2011.

RICHARD REINBOLD, President

ATTEST:

MARY E. PIERCE, Clerk

Ayes: 6

Nays: 0

Absent: 0

Abstain: 0

(Exhibit E1)

(Exhibit F1)

(Exhibit G1)

(Exhibit H1)

http://www.epa.gov/air/particlepollution/health.html
Last updated on Wednesday, July 06, 2011

Particulate Matter

Health

The size of particles is directly linked to their potential for causing health problems. Small particles less than10 micrometers in diameter pose the greatest problems, because they can get deep into your lungs, and some may even get into your bloodstream.

Exposure to such particles can affect both your lungs and your heart. Small particles of concern include "inhalable coarse particles" (such as those found near roadways and dusty industries), which are larger than 2.5 micrometers and smaller than 10 micrometers in diameter; and "fine particles" (such as those found in smoke and haze), which are 2.5 micrometers in diameter and smaller.

The Clean Air Act requires EPA to set air quality standards to protect both public health and the public welfare (e.g. crops and vegetation). Particle pollution affects both.

Health Effects

Particle pollution - especially fine particles - contains microscopic solids or liquid droplets that are so small that they can get deep into the lungs and cause serious health problems. Numerous scientific studies have linked particle pollution exposure to a variety of problems, including:

- increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing, for example;
- decreased lung function;
- aggravated asthma;
- development of chronic bronchitis;
- irregular heartbeat;
- nonfatal heart attacks; and
- premature death in people with heart or lung disease.

People with heart or lung diseases, children and older adults are the most likely to be affected by particle pollution exposure. However, even if you are healthy, you may experience temporary symptoms from exposure to elevated levels of particle pollution. For more information about asthma, visit www.epa.gov/asthma.

Environmental Effects

Visibility reduction

Fine particles ($PM_{2.5}$) are the major cause of reduced visibility (haze) in parts of the United States, including many of our treasured national parks and wilderness areas. For more information about visibility, visit www.epa.gov/visibility.

Environmental damage

Particles can be carried over long distances by wind and then settle on ground or water. The effects of this settling include: making lakes and streams acidic; changing the nutrient

balance in coastal waters and large river basins; depleting the nutrients in soil; damaging sensitive forests and farm crops; and affecting the diversity of ecosystems. More information about the effects of particle pollution and acid rain.

Aesthetic damage

Particle pollution can stain and damage stone and other materials, including culturally important objects such as statues and monuments. More information about the effects of particle pollution and acid rain.

You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

For more information on particle pollution, health and the environment, visit:

Particle Pollution and Your Health: Learn who is at risk from exposure to particle pollution, what health effects you may experience as a result of particle exposure, and simple measures you can take to reduce your risk. (PDF, 2 pp, 320 KB)

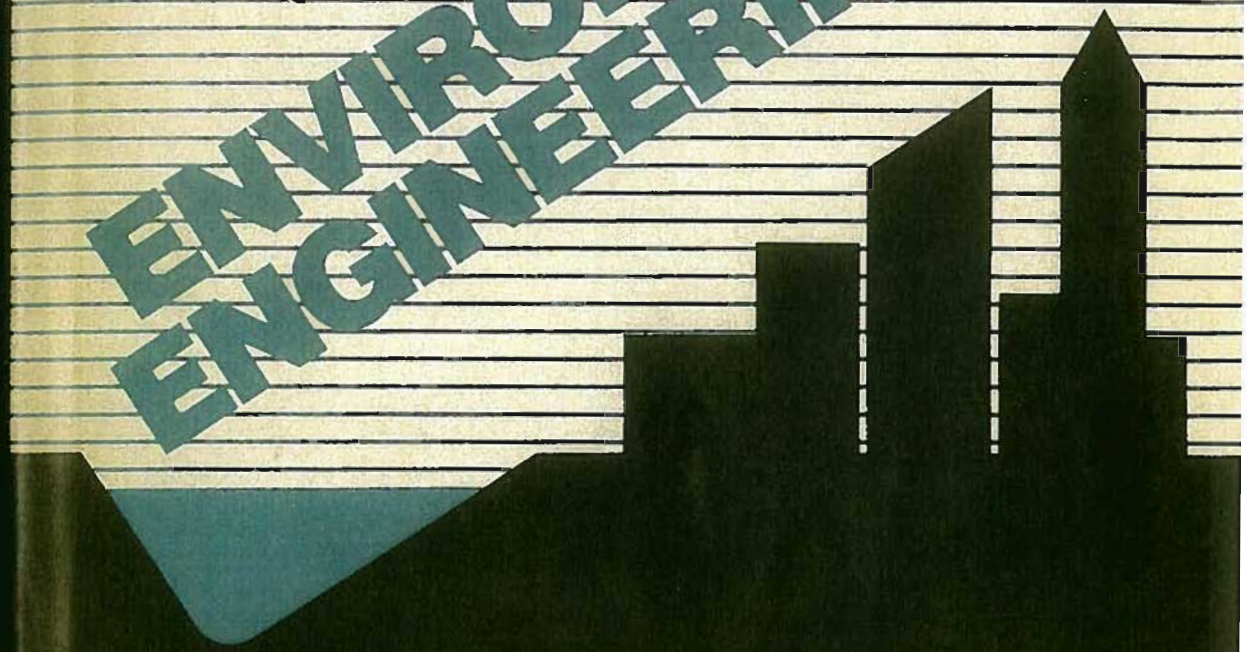
How Smoke From Fires Can Affect Your Health: It's important to limit your exposure to smoke -- especially if you may be susceptible. This publication provides steps you can take to protect your health.

Air Quality Criteria Document for Particulate Matter (October 2004): This comprehensive assessment of scientific data about the health and environmental effects of particulate matter is an important part of EPA's review of its particle pollution standards.

(EXHIBIT I-1)

HOWARD S. PEAVY
DONALD R. ROWE
GEORGE TCHOBANOGLOUS

ENVIRONMENTAL ENGINEERING



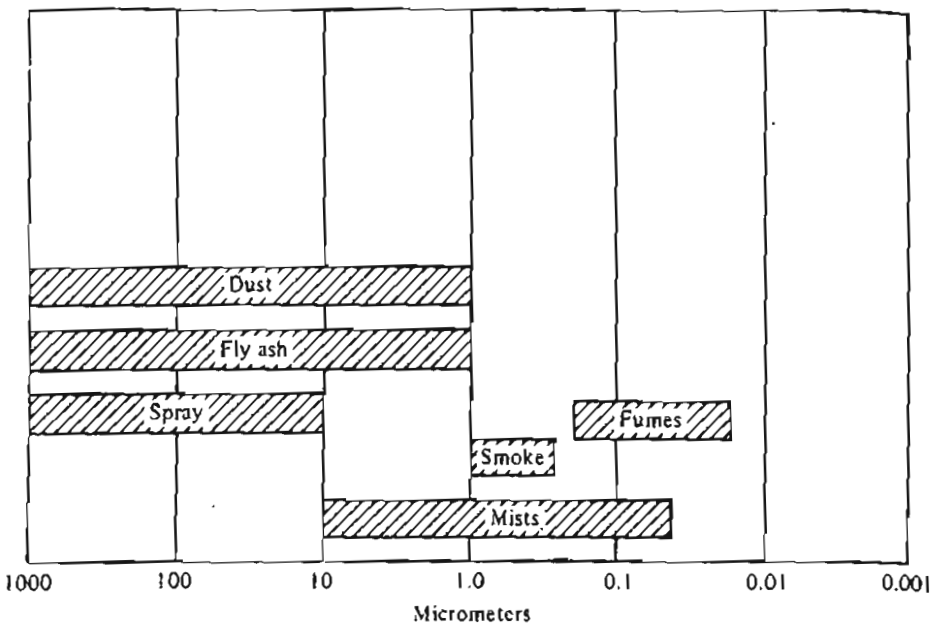


Figure 7-3 Sizes of particulates in micrometers. (*Adapted from Federal Register* [7-54].)

suspension in air or other gases, dusts do not diffuse. They settle under the influence of gravity. As indicated in Fig. 7-3, dusts may range in size from 1.0 to 10000 μm.

Smoke, fine, solid particles resulting from the incomplete combustion of organic particles such as coal, wood, or tobacco, consists mainly of carbon and other combustible materials. Smoke particles have diameters ranging from 0.5 to 1 μm.

Fumes are fine, solid particles (often metallic oxides such as zinc and lead oxides) formed by the condensation of vapors of solid materials. Fumes may be from sublimation, distillation, calcination, or molten metal processes, and they range in size from 0.03 to 0.3 μm. Fumes flocculate and coalesce, then settle out.

Fly ash consists of finely divided, noncombustible particles contained in flue gases arising from combustion of coal. Inherent in all coal, these mineral or metallic substances are released when the organic portion of coal is burned. Fly ash shares characteristics of all three of the other solid particulates discussed. Like dust, it has particles that range in size from 1.0 to 1000 μm; like smoke, it results from burning; and like fumes, it consists of inorganic metallic or mineral substances.

Mist consists of liquid particles of droplets formed by the condensation of a vapor, the dispersion of a liquid (as in foaming or splashing), or the enactment of a chemical reaction (such as the formation of sulfuric acid mist). Mists are usually less than 10 μm in diameter. If mist concentration is high enough to obscure visibility, the mist is called a fog.

Spray consists of liquid particles formed by the atomization of parent liquids, such as pesticides and herbicides. Spray particles range in size from 10 to 1000 μm.

(Exhibit J 1)

Chapter 18

Outdoor Air Quality: The Six Common Air Pollutants

The Clean Air Act established two types of National Ambient Air Quality Standards. "Primary" standards are designed to establish limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. "Secondary" standards set limits to protect public welfare, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

For each of these pollutants, EPA tracks two kinds of air pollution trends: air concentrations based on actual measurements of pollutant concentrations in the ambient (outside) air at selected monitoring sites throughout the country, and emissions based on engineering estimates of the total tons of pollutants released into the air each year. Despite the progress made in the last 30 years, millions of people live in counties with monitor data showing unhealthy air for one or more of the six common pollutants.

Text in this chapter is from the "Air Quality Where You Live" series of fact sheets produced by the U.S. Environmental Protection Agency (EPA), 2000: "What are the Six Common Air Pollutants?" "How Ground-Level Ozone Affects the Way We Live and Breathe," "How Particulate Matter Affects the Way We Live and Breathe," "How Carbon Monoxide Affects the Way We Live and Breathe," "How Nitrogen Oxides Affect the Way We Live and Breathe," "How Sulfur Dioxide Affects the Way We Live and Breathe," and "How Lead Affects the Way We Live and Breathe," available online at http://www.epa.gov/air/urbanair.

Exposure to these pollutants is associated with numerous effects on human health, including increased respiratory symptoms, hospitalization for heart or lung diseases, and even premature death.

Ground-Level Ozone

What Is It? Where Does It Come From?

Ozone (O_3) is a gas composed of three oxygen atoms. It is not usually emitted directly into the air, but at ground level is created by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of heat and sunlight. Ozone has the same chemical structure whether it occurs miles above the earth or at ground level and can be good or bad, depending on its location in the atmosphere. Good ozone occurs naturally in the stratosphere approximately 10 to 30 miles above the earth's surface and forms a layer that protects life on earth from the sun's harmful rays. In the earth's lower atmosphere, ground-level ozone is considered bad.

VOC + NO_x + Heat + Sunlight = Ozone

Motor vehicle exhaust and industrial emissions, gasoline vapors, and chemical solvents are some of the major sources of NO_x and VOC, that help to form ozone. Sunlight and hot weather cause ground-level ozone to form in harmful concentrations in the air. As a result, it is known as a summertime air pollutant. Many urban areas tend to have high levels of bad ozone, but even rural areas are also subject to increased ozone levels because wind carries ozone and pollutants that form it hundreds of miles away from their original sources.

Chief Causes for Concern

Ground-level ozone:

- Triggers a variety of health problems even at very low levels
- May cause permanent lung damage after long-term exposure
- Damages plants and ecosystems

The Summertime Pollutant

Peak ozone levels typically occur during hot, dry, stagnant summertime conditions. The length of the ozone season varies from one

area of the United States to another. Southern and Southwestern states may have an ozone season that lasts nearly the entire year.

Ozone Can Be Transported over Long Distances

Ozone and the chemicals that react to form it can be carried hundreds of miles from their origins, causing air pollution over wide regions. Millions of Americans live in areas where ozone levels exceed EPA's health-based air quality standards, primarily in parts of the Northeast, the Lake Michigan area, parts of the Southeast, southeastern Texas, and parts of California.

Ozone and the pollutants that form it can cause air quality problems hundreds of miles away.

Particulate Matter

What Is It? Where Does It Come From?

Particulate matter, or PM, is the term for particles found in the air, including dust, dirt, soot, smoke, and liquid droplets. Particles can be suspended in the air for long periods of time. Some particles are large or dark enough to be seen as soot or smoke. Others are so small that individually they can only be detected with an electron microscope.

Some particles are directly emitted into the air. They come from a variety of sources such as cars, trucks, buses, factories, construction sites, tilled fields, unpaved roads, stone crushing, and burning of wood.

Other particles may be formed in the air from the chemical change of gases. They are indirectly formed when gases from burning fuels react with sunlight and water vapor. These can result from fuel combustion in motor vehicles, at power plants, and in other industrial processes.

Chief Causes for Concern

Particulate Matter:

- is associated with serious health effects.
- is associated with increased hospital admissions and emergency room visits for people with heart and lung disease.
- is associated with work and school absences.
- is the major source of haze that reduces visibility in many parts of the United States, including our National Parks.

- settles on soil and water and harms the environment by changing the nutrient and chemical balance.
- causes erosion and staining of structures including culturally important objects such as monuments and statues.

Health problems for sensitive people can get worse if they are exposed to high levels of PM for several days in a row.

CO

What Is It? Where Does It Come From?

Carbon monoxide, or CO, is a colorless, odorless gas that is formed when carbon in fuel is not burned completely. It is a component of motor vehicle exhaust, which contributes about 56 percent of all CO emissions nationwide. Other non-road engines and vehicles (such as construction equipment and boats) contribute about 22 percent of all CO emissions nationwide. Higher levels of CO generally occur in areas with heavy traffic congestion. In cities, 85 to 95 percent of all CO emissions may come from motor vehicle exhaust. Other sources of CO emissions include industrial processes (such as metals processing and chemical manufacturing), residential wood burning, and natural sources such as forest fires. Woodstoves, gas stoves, cigarette smoke, and unvented gas and kerosene space heaters are sources of CO indoors. The highest levels of CO in the outside air typically occur during the colder months of the year when inversion conditions are more frequent. The air pollution becomes trapped near the ground beneath a layer of warm air.

Chief Causes for Concern

CO:

- is poisonous even to healthy people at high levels in the air.
- can affect people with heart disease.
- can affect the central nervous system.

Motor Vehicle Use Is Increasing

Nationwide, three-quarters of carbon monoxide emissions come from on-road motor vehicles (cars and trucks) and non-road engines (such as boats and construction equipment). Control measures have reduced pollutant emissions per vehicle over the past 20 years, but

the number of cars and trucks on the road and the miles they are driven have doubled in the past 20 years. Vehicles are now driven two trillion miles each year in the United States. With more and more cars traveling more and more miles, growth in vehicle travel may eventually offset progress in vehicle emissions controls.

Malfunctions and Tampering Reduce the Effectiveness of Emission Control Systems

Today's sophisticated emission control systems on vehicles are designed to keep pollution to a minimum, but vehicles quickly become polluters when their emission controls do not work correctly or if drivers tamper with them.

NO_x

What Is It? Where Does It Come From?

Nitrogen oxides, or NO_x, is the generic term for a group of highly reactive gases, all of which contain nitrogen and oxygen in varying amounts. Many of the nitrogen oxides are colorless and odorless. However, one common pollutant, nitrogen dioxide (NO_2) along with particles in the air can often be seen as a reddish-brown layer over many urban areas.

Nitrogen oxides form when fuel is burned at high temperatures, as in a combustion process. The primary sources of NO_x are motor vehicles, electric utilities, and other industrial, commercial, and residential sources that burn fuels.

Chief Causes for Concern

NO_x:

- is one of the main ingredients involved in the formation of ground-level ozone, which can trigger serious respiratory problems.
- reacts to form nitrate particles, acid aerosols, as well as NO_2, which also cause respiratory problems.
- contributes to formation of acid rain.
- contributes to nutrient overload that deteriorates water quality.
- contributes to atmospheric particles, that cause visibility impairment most noticeable in national parks.

- reacts to form toxic chemicals.
- contributes to global warming.

NO_x and the pollutants formed from NO_x can be transported over long distances, following the pattern of prevailing winds in the U.S. This means that problems associated with NO_x are not confined to areas where NO_x are emitted. Therefore, controlling NO_x is often most effective if done from a regional perspective, rather than focusing on sources in one local area. NO_x emissions are increasing.

Since 1970, EPA has tracked emissions of the six principal air pollutants—carbon monoxide, lead, nitrogen oxides, particulate matter, sulfur dioxide, and volatile organic compounds. Emissions of all of these pollutants have decreased significantly except for NO_x which has increased approximately 10 percent over this period.

SO_2

What Is It? Where Does It Come From?

Sulfur dioxide, or SO_2, belongs to the family of sulfur oxide gases (SO_x). These gases dissolve easily in water. Sulfur is prevalent in all raw materials, including crude oil, coal, and ore that contains common metals like aluminum, copper, zinc, lead, and iron. SO_x gases are formed when fuel containing sulfur, such as coal and oil, is burned, and when gasoline is extracted from oil, or metals are extracted from ore. SO_2 dissolves in water vapor to form acid, and interacts with other gases and particles in the air to form sulfates and other products that can be harmful to people and their environment.

Over 65% of SO_2 released to the air, or more than 13 million tons per year, comes from electric utilities, especially those that burn coal. Other sources of SO_2 are industrial facilities that derive their products from raw materials like metallic ore, coal, and crude oil, or that burn coal or oil to produce process heat. Examples are petroleum refineries, cement manufacturing, and metal processing facilities. Also, locomotives, large ships, and some non-road diesel equipment currently burn high sulfur fuel and release SO_2 emissions to the air in large quantities.

Chief Causes for Concern

SO_2 contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases.

SO_2 contributes to the formation of acid rain, which:

- damages trees, crops, historic buildings, and monuments; and
- makes soils, lakes, and streams acidic.

SO_2 contributes to the formation of atmospheric particles tha cause visibility impairment, most noticeably in national parks.

SO_2 can be transported over long distances.

SO_2 and the pollutants formed from SO_2, such as sulfate particles can be transported over long distances and deposited far from th point of origin. This means that problems with SO_2 are not confinec to areas where it is emitted.

People with asthma are particularly affected by peak levels of SO_2.

Short-Term Peak Levels

High levels of SO_2 emitted over a short period, such as a day, can be particularly problematic for people with asthma. EPA encourages communities to learn about the types of industries in their communities and to work with local industrial facilities to address pollution control equipment failures or process upsets that could result in peak levels of SO_2.

Lead

What Is It? Where Does It Come From?

Lead is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been motor vehicles (such as cars and trucks) and industrial sources. Due to the phase out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of lead in air are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid battery manufacturers.

Chief Causes for Concern

Lead:

- particularly affects young children and infants
- is still found at high levels in urban and industrial areas
- deposits on soil and water and harms animals and fish

(Exhibit K1)

HIGHWAY ENGINEERING

FIFTH • EDITION

Paul H. Wright &
Radnor J. Paquette

chapter twenty

CONCRETE PAVEMENTS

The many and varied uses of portland cement concrete in the United States have made this material such an integral part of our everyday lives that it hardly seems necessary to define it. However, "portland cement concrete" may be defined as a plastic and workable mixture composed of mineral aggregate such as sand, gravel, crushed stone, or slag, interspersed in a binding medium of cement and water. When first combined, the materials listed form a plastic, workable mass that may be easily handled and shaped into any desired form. A short time after mixing, the concrete begins to stiffen or "set" because of chemical action between the cement and water in the mixture, and in a relatively short time it forms a dense, hard mass that possesses considerable compressive and flexural strength.

When properly designed and constructed, concrete roads and streets are capable of carrying almost unlimited amounts of any type of traffic with ease, comfort, and safety. Surfaces of this type are smooth, dust-free, and skid-resistant, having a high degree of visibility for both day and night driving and generally having low maintenance costs. They are economical in many locations because of their low cost of maintenance and their relative permanence. They are, of course, classed as high-type pavements. The principal use of surfaces of this type has been in the construction of heavily traveled roads and city streets, including those in residential, business, and industrial areas. It is the standard material for urban expressways, even in states where asphalt surfaces are widely used. A wearing surface of portland cement concrete usually consists of a single layer of uniform cross section that has a thickness of 6 to 11 in. and that may not require a separate base course, often being constructed directly on a prepared subgrade or subbase. A new concrete base course may be constructed to serve as a support for one of the several types of bituminous wearing surfaces. Old concrete pavements have been extensively used as bases for new bituminous wearing surfaces in many areas.

A further distinction may be noted between the surfaces and bases that are discussed in this chapter and the so-called flexible pavements that have previously been described in this book. Concrete surfaces and bases are frequently classed as "rigid" pavements, the term "rigid" implying that pavements constructed of this material possess a certain degree of "beam strength" that permits them to span or "bridge over" some minor irregularities in the subgrade or subbase on which they rest. Thus minor defects or irregularities in the supporting foundation layer may not be reflected in the surface course, al-

though, of course, defects of this type are certainly not desirable, as they may lead to failure of the pavement through cracking, breaking, or similar distress.

The design and construction of concrete pavements is a fairly complex subject and it seems desirable to list the major topics that will be covered in this chapter. Major subjects that will be discussed in subsequent sections include materials, proportioning of concrete mixtures, structural pavement design, and the construction of portland cement concrete pavements.

In the interests of simplification, in the remainder of this text the term "concrete" will be taken to be synonymous with "portland cement concrete."

MATERIALS

The materials included in concrete, as generally used in highway construction, are coarse aggregate, fine aggregate, water, cement, and one or more admixtures. These materials will be discussed in turn in the following sections, along with a discussion of typical requirements of specifications related to each.

20-1 Coarse aggregate

Coarse aggregates most frequently used in portland cement concrete include crushed stone, gravel, and blast-furnace slag. Other similar inert materials may also be used, and the listed materials may be used singly or in combination with one another. Specific requirements related to coarse aggregates to be used for this purpose may be divided into five groups: deleterious substances, percentage of wear, soundness, weight per cubic foot (slag), and grading.

As mentioned in Chapter 15, highway agencies specify the maximum percentages of various deleterious substances which are permitted to be present in aggregates. Specific requirements related to the cleanliness of the aggregate vary somewhat with different agencies. The requirements in Table 20-1 related to deleterious substances are indicative of those in current use (*1*).

In certain areas, considerable difficulty has been experienced with aggregates that contain deleterious substances which react harmfully with the alkalies present in the cement. Such reactions generally result in abnormal expansion of the concrete. Methods have been devised (ASTM Methods C227 and C289) for detecting aggregates with these harmful characteristics, and suitable stipulations are included in typical specifications (for example, ASTM C33).

The ability of the coarse aggregate to resist abrasion is generally controlled by inclusion of the specifications of a maximum permissible percentage of wear in the Los Angeles abrasion test. Maximum permissible percentages of wear in this test (AASHTO Designation T96) range from as low as 30 to as high as 65 in the specifications of the various state highway departments. On the average, however, the maximum permissible loss varies from 40 to 50 percent for all three of the principal types of coarse aggregate, although many specifications do not contain a requirement related to the percentage of wear of slag.

A number of states, particularly those in the northern portion of the country, include requirements related to soundness, as measured by the use of