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TECHNOLOGIES FOR LOW CONCENTRATION ORGANIC VAPOR GAS STREAMS

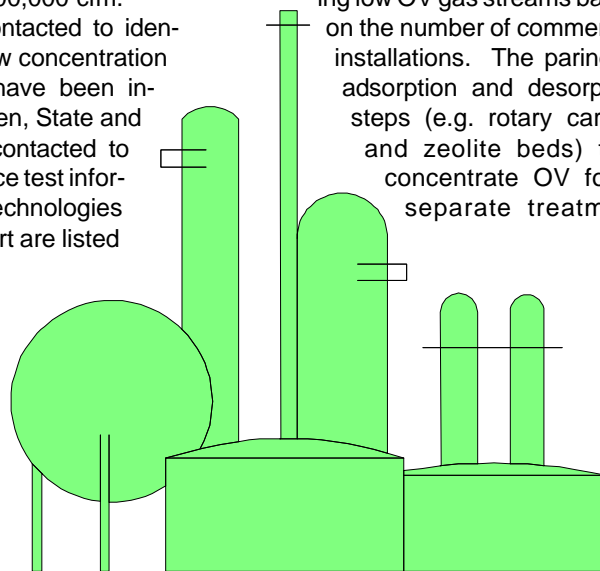
By Bob Blaszcak
CTC/OAQPS

The CTC has completed "Survey of Control Technologies for Low Concentration Organic Vapor Gas Streams," EPA-456/R-95-003. The term organic vapor (OV), as used in this report, includes both volatile organic compounds (VOC) and organic hazardous air pollutants (HAP). The purpose of this study was to identify permitted control devices that have been installed and demonstrated to be effective for treating low concentration OV gas streams, particularly those with high air flow rates. For

this report, low concentration means 100 ppm or below and high flow rates means those above 100,000 cfm. Manufactures were contacted to identify locations where low concentration OV control systems have been installed and tested. Then, State and local agencies were contacted to obtain permit and source test information. The types of technologies considered in this report are listed in TABLE 1.

Technologies are commercially available to treat low OV gas streams, some with efficiencies >99%. As can be expected, the lower the concentration in the gas stream the higher the control cost. Ad-

sorption-based technologies are the most popular control systems for treating low OV gas streams based on the number of commercial installations. The paring of adsorption and desorption steps (e.g. rotary carbon and zeolite beds) that concentrate OV for a separate treatment



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AIR WAVES

By Bob Blaszcak
CTC/OAQPS, Co-Chair

Well it's 1:45 Sunday afternoon, July 9, 1995. It's a sunny day in the mid to upper 80's. A great day to be at the lake or beach (or down the shore for you folks back home in PA & NJ). But here I sit at my home computer trying to put together the last few items for the July CTC NEWS. I hope your summer has been more relaxing than mine and that this edition of the CTC NEWS reaches you before Labor Day.

It has been very busy here. We've been trying to put the final touches on a few overdue CTC reports, finalize the CTC annual report for FY94 (Yea, I know it's almost FY96, but what else is new?), establish the new U.S.- Mexico Border Air Pollution Information Center, put out the annual RACT/ BACT/LAER Clearinghouse (RBLC) update report, and get the Small Business Assistance Program (SBAP) electronic

bulletin board system (BBS) operational while maintaining all our regular CTC services - all of this with less resources than in years past. (Although staff resources look about the same on paper, most CTC staffers have acquired new non-CTC duties.) I feel like we are really testing that line about doing more with less. Remember that story about all the work that has to get done. It finds an excuse for everyone else in the world except the storyteller (in this case, me) and the person he's telling it to. The punch line is that there's no one left but the other person and me to do all the work, so let's get to it. Well, I think they laid off the other person!

I am glad to announce that we have completed several CTC reports that address existing and emerging technologies for treating low concentration organic vapor emissions (lead article), prevention and control options for ammonia emissions, and State and local regulations that have gone beyond VOC CTG RACT requirements. There are articles on each report in this edition of the CTC NEWS. If you're interested in the CTC FY94 Annual report, it should be available in August, just in time for our annual meeting with our STAPPA/ ALAPCO advisory group (it's in final editing).

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ORGANIC VAPOR GAS STREAMS

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step (usually an incinerator) are increasingly proposed, especially for high flow OV streams.

Absorption/stripping and ultraviolet (UV)/ozone catalytic oxidation also are successfully being used to treat low OV streams and, based on limited cost information, may be competitive with the more widely used adsorption based processes in certain cases. In addition, regenerative incineration units are being proposed by vendors to treat low OV gas streams.

There is a trend for vendors to collaborate to provide "best-of-breed" combinations of devices to make up a case specific control system. The development of these hybrid systems is developing at a rapid pace which appears to be driven by the implementation of new and existing regulations.

Currently, 25 control systems for low concentration, high flow OV gas streams are known to exist in the U.S. All are either permitted, being permitted, or installed under a consent order. Documentation in the form of permits and

source test results was requested for all these devices during this study. Descriptions and relevant details on all these systems, such as process diagram, inlet concentration, flow rate, industrial application, and location, are provided in the report.

Control of low concentration OV streams is currently one of the most dynamic segments of the air pollution control technology industry. The technologies as well as their applications are undergoing rapid change and development. This study offers a snapshot of low OV technology at a particular point in time. Anyone using this report should be prepared to seek out updates on these technologies, especially on cost-effectiveness data. The CTC will consider updating this report periodically to adequately reflect

TYPE	DESCRIPTION
Incineration	Catalytic Regenerative Thermal Recuperative Heat Recovery Flares Boilers and Process Heaters
Adsorption (Carbon/Zeolite/Polymer)	Nonregenerable Adsorption Regenerable Fixed Bed Modified Adsorption (including adsorption/incineration combinations)
Absorption	Various Commercial Scrubber Systems
Other Technologies	Enhanced Carbon Adsorption Condensation Flameless Thermal Oxidation Biofiltration
Emerging Technologies	Corona Discharge Heterogeneous Photocatalysis

TABLE 1: CONTROL TECHNOLOGIES EVALUATED

this dynamic segment of technology development.

This report can be downloaded from the CTC BBS. Government agencies can request a hard copy by calling the CTC HOTLINE. Others can purchase a hard copy from the National Technical Information Service (NTIS) by calling (800) 553-6847.

AIR WAVES

(continued from page 1)

We actually did get the U.S.-Mexico Border Information Center on Air Pollution, CICA (*Centro de Información sobre Contaminación del Aire* in Spanish) on line on May 1, 1995. It offers a bilingual (Spanish & English) HOTLINE (919/541-1800), and many CTC type services to support efforts to improve air quality along the border. CICA's primary target customers are the Federal, State and local government air pollution agencies and universities in Mexico and the U.S. who are working on air pollution problems along the border. Mr. Jaime Mendieta, a senior environmental employee, has joined the CTC and will be answering the CICA HOTLINE. If

you're working on U.S.-Mexico border issues and need help, give Jaime a call.

The annual RBLC report is moving along and should be to the printer by the end of July. Agency RBLC contacts should be receiving their copies in September. Remember, all the information in this year's report is available now! Just turn on your PC, get on-line with the OAQPS Technology Transfer Network (TTN) and select the RBLC BBS. All current and historical data in the Clearinghouse will be at your fingertips. By the way, if you didn't notice, our name is changing from BLIS (BACT/LAER Information System) to RBLC. We don't mean to confuse you, but we think it's time to switch to the name actually established for the Clearinghouse in the 1990 Clean Air Act Amendments. Depending when you read this, the change

may or may not have happened yet. So, if you don't see one of these names look for the other on the TTN menu.

Joe Steigerwald has suggested that we change to a quarterly or seasonal designation for the CTC NEWS rather than the January, April, July, and October designations that we have historically used. He almost has me convinced to make the change, but I'm concerned that a less specific target date to get out the NEWS may result in a more lax attitude about getting the job done. I feel bad enough if I get the NEWS to you a month or two late. I can't imagine how I would feel if you got the Winter edition in the Spring or Fall.

I hope you're having a great summer. See you in October (at least we'll try)!

MACT, CTG, NSPS, ACT AND TITLE I RULE SCHEDULES**

<u>MACT STANDARD</u>	<u>Proposal</u>	<u>Final</u>	<u>ACT</u>	<u>Final</u>
Aerospace (coatings)	*6/6/94	8/95	Plywood/Particle Board (PM10)	Schedule Under Dev.
Asbestos MACT/GACT	*1/24/95***	11/95***	Batch Processes	*2/7/95
Asbestos Litigation	*1/1/93	***		
Ferroalloys	9/95	11/96	<u>NSPS</u>	<u>Proposal</u>
Flexible Polyurethane Foam	2/96	1/97	Degreaser NSPS	*8/31/94
Marine Vessel (load/unload)	*5/13/94	8/95	Elec. Utility Gen. Rev. (NOx)	*5/30/94
Mineral Wool	2/96	3/97	Landfill NSPS & 111(d)	*5/30/91
Off-site Waste & Recovery	*10/13/94	11/95	Med. Waste Inc. NSPS & 111(d)	*2/1/95
Petroleum Refineries	*6/30/94	8/95	NOx NSPS Revision (407(c))	11/95
Pharmaceutical Production	3/96	11/97	Mun. Waste Combustors II & III	*9/20/94
Polymers & Resins I	*6/15/95	5/96	SOCMI Sec. Sources NSPS	*8/31/94
Polymers & Resins II	*5/16/94	*3/8/95	Starch Mfg. Industry NSPS	*8/31/94
Polymers & Resins III	Schedule Under Revision			
Polymers & Resins IV	*3/15/95	3/96	<u>Other Rules</u>	<u>Proposal</u>
Portland Cement	1/96	1/97	Arch./Ind. Coatings (§183e)	*5/5/95
Primary Aluminum Prod.	10/95	11/96	Auto Refinishing (§183e)	Schedule Under Dev.
Printing/Publishing	*3/1/95	3/96	Consumer Products List (§183e)	*8/31/94
Pulp & Paper (combustion)	*2/27/95	12/96	Haz. Waste TSDf, Phase II	
Pulp & Paper (non-comb.)	10/95	3/96	(RCRA)	*7/22/91
Secondary Aluminum Prod.	11/95	12/97	Haz. Waste TSDf, Phase III	12/95
Secondary Lead Smelters	*5/31/94	*6/23/95	(RCRA)	Schedule Under Revision
Shipbuilding (coatings)	*11/22/94	11/95		
Wood Furniture Coating	*11/21/94	11/95		
Wood Treatment	11/95	11/96		
<u>CTG ****</u>	<u>Proposal</u>	<u>Final</u>		
Aerospace Coatings	*11/15/94	8/95		
Industrial Wastewater	*12/29/93	on Hold		
Shipbuilding (coating)	Schedule Under Review			
Offset Lithography	*11/8/93	on Hold		
Plastic Parts Coating	on Hold	on Hold		
VOL Storage	*12/2/93	on Hold		
Wood Furniture Coating	*11/21/94	11/95		

NOTE:

* Indicates date rule appeared in Federal Register.

** All schedules are tentative and subject to change without notice. Only those rules with proposal or promulgation dates within one year are included. Completed rules are removed from list after six months.

***Schedule to be determined by litigation/negotiation

****ACT's have been issued for most CTG categories.

BEYOND RACT

Mohamed Serageldin, Ph.D.
ESD/OAQPS

The "Beyond VOC RACT CTG Requirements" study is completed. This study was requested by the Lake Michigan Air Directors Consortium (LMADCO) and should help states in their emission reduction efforts to attain the national ambient air quality standards (NAAQS) for ozone. The study identifies State, local, and District regulations that exceed reasonably available control technology (RACT) requirements that are specified in the Federal control techniques guidelines

(CTGs). States can use this information to tighten requirements for CTG RACT source categories.

CTG groups I, II, and III are the focus of this study. A maximum of six state regulations were considered for each source category. Regulations from eight states (Colorado, Connecticut, Maine, New Jersey, New York, Rhode Island, Texas, and Utah) and two California control districts were examined. The two California Districts evaluated were the Bay Area Air Quality Management District (AQMD) and the South Coast AQMD. The more stringent regulations and those that we identified to have pollution prevention provisions were summarized for quick reference in a tabular format (see Table 1 for

an example).

The original request from LADCO was to evaluate the stringency of the different regulations since more stringent regulations would be aimed to achieve higher reduction in emissions. We recognize, however, that a more stringent requirement in a regulation will not always directly translate into a reduction in emissions. For example, more stringent emission limits on the VOC content of coatings (including inks) do not necessarily result in reductions in emissions, unless the total amount of the lower VOC coatings is also restricted by the regulation in terms of a production parameter (a material balance approach). Nevertheless, *(continued page 4)*

BEYOND RACT

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tighter emission limits were marked in Table 1 as more stringent.

In most cases comparing stringency of emission limits was straightforward. However, many of the regulations had additional (sometimes more specific) requirements than those required by RACT in the CTG. Many of those proved difficult to evaluate for stringency; for example the emission impacts of requirements specifying general design criteria, equipment specifications, or work practices are difficult to determine. If an additional requirement in a regulation did not appear to result in a quantifiable extra reduction in pollution, the regulation was not termed more stringent than the CTG RACT.

In this study a distinction is made between two aspects of a regulation that affect the emission reduction achievable: the stringency of the regulation and the applicability of the regulation. In Table 1 an "X" under the column labelled "Stringency" identifies those regulations found to be more stringent than the CTG. The X under the column labelled "Applicability" is used to identify those regulations that provide specific exemptions or affect different source

TABLE 1: EXAMPLE OF SUMMARY TABLE

CTG CATEGORY	STATE/DISTRICT	EMISSION REDUCTION COMPARISON				POTENTIAL EMISSION REDUCTION
		STRINGENCY	APPLICABILITY	POLLUTION PREVENTION		
				WORK PRACTICES	OTHER	
SURFACE COATING OF FABRICS	COLORADO					
	NEW JERSEY		X			X
	RHODE ISLAND	X				
	UTAH					
	MAINE					
	BAY AREA AQMD	X	X			X
	SOUTH COAST AQMD	X				X

- Federal CTG and "Blue Book" used as the basis.
- State/District rule provides quantifiable additional reduction relative to CTG.
- State/District rule affects additional sources and may provide additional reductions relative to CTG

populations than indicated in the CTG. The term applicability was used to highlight the possibility that the regulation may result in lower (or higher) reductions. An X under pollution prevention meant that the requirement in the regulation would lead to quantifiable reductions at the source of pollution. The report also includes detailed tables assessing and comparing each rule by CTC category

At least one State (or District) regulation had rules which were more strin-

gent than Federal RACT in 24 of the 28 CTG categories considered. Overall, the Bay Area and South Coast regulations are more stringent than Federal RACT and State regulations.

The report, EPA-453/R-95-010, can be downloaded from the CTC BBS. Government agencies can request a copy by calling the CTC HOTLINE. Others can purchase a copy by calling the National Technical Information Service (NTIS) at (800) 553-6847.

NEW RBLC FEATURES SAVE, JUMP, AND MARK

By Jo Ann Kerrick, ViGYAN

The RACT/BACT/LAER Clearinghouse (RBLC) has made several improvements to help you work more efficiently. These new features will get you to your data faster. They're available now! Try them out.

Save Search Criteria

The Query module in the RBLC information system allows you to search any of its data bases using customized combinations of search fields, operators, and values. This capability gives you tremendous flexibility, but it can be extremely frustrating when you have to re-enter the same criteria in order to search a different data base. The RBLC now has an option that elimi-

nates this duplicate work. You can save your search criteria and automatically reapply it to another data base. Whenever you're exiting from the query menu after building a search criteria, the system asks if you want to save the search criteria before returning to the data base selection menu. If you do save your criteria and then select another data base to search, the system automatically searches the new data base with the saved criteria. It shows the number of determinations that meet the criteria and then displays the Query menu. If the search is successful, you can immediately view or download the data. Just as with other searches you perform, you can use the advanced search option to edit the saved criteria, and you can

reactivate any of the subsets or the main data base. If you build complicated criteria that you want to use on several RBLC data bases, try this new option to save keystrokes and time.

"Jump" to Facility

The Browse module of the regulation data base (REGS) was designed to let you scan all of the rules in the data base without doing a potentially time-consuming search. Two new options let you move around the complete rule list and mark information for download in record time. Browse sorts the regulation list by affected facility name to help you find rules of interest as you page through the data base. A new "Jump"

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RBLC FEATURES

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option allows you to enter a letter and move directly to the affected facility whose name begins with that letter. If you are looking for the rule for "SULFURIC ACID PLANTS", the jump option saves you the trouble of paging through the rules from A to R. If the data base does not contain any rules that begin with a particular letter, jump moves down the rule list to the affected facility that begins with the next higher letter in the alphabet (for example, "RUBBER TIRE MFG" when you try to jump to "Q"). Jump may not help you locate a rule exactly in all cases, but it is a good way to move quickly around the entire REGS data base.

"Mark" for Download

In addition to viewing rules on-line, Browse allows you to mark selected rules and download them to your local

PC. The original version required you to choose a regulation from the list and go to the regulation data screen in order to mark the rule for downloading. A new "Mark" option at the rule list is faster to get to and lets you mark several rules with fewer keystrokes. When you select mark, a pop-up box prompts you to enter the appropriate mark option (Figure 1). You can mark or unmark all of the rules currently displayed on the screen, or you can mark/unmark a single rule. For single rules, this option acts as a toggle, switching the mark on or off. If you're only interested in one rule, it doesn't much matter how you mark your selection. When you want to download a group of rules, the mark option is noticeably faster. You can mark the rules of interest to you while paging through the rule list.

Try these new options in REGS Browse, and see for yourself how quick and easy it is to locate information you need.

AMMONIA CONTROL AND P2 OPTIONS

By Bob Blaszcak,
CTC/OAQPS

The CTC has completed "Control and Pollution Prevention Options for Ammonia Emissions," EPA-456/R95-002. This report was undertaken to provide CTC HOTLINE callers who have expressed concern over the hazards of ammonia with needed pollution prevention (P2) and control technology information. Although Congress decided not to include ammonia in the list of hazardous air pollutants in Section 112(b) of the Clean Air Act, ammonia's toxicity, explosive nature and odor problems make it a concern that needs to be considered by environmental and health agencies.

The main sources of ammonia emissions are fertilizer production, coke manufacturing using the by-product recovery method, fossil fuel combustion through the control of NOx, livestock management, and refrigeration. This CTC report focuses on these industries since they are the only ones that have been identified as implementing P2 or control methods to reduce ammonia emissions. The technologies used by these industries include wet scrubbers, condensate strippers, recovery and recycle techniques, reducing agent limitation, capture systems, and good maintenance practices. Most of these methods are feasible and may be applied to

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REGS REC	BROWSE	VIEW REGULATION LIST	
NO	RULE ID	BASIS	AFFECTED FACILITY
14 C	RUS-0097	MACT	CHROMIUM ELECTROPLATING AND ANODIZING
15	RUS-0031	NSPS	COAL PREPARATION PLANTS
16	RUS-0023		
17 C	RUS-0093		
18 C	RUS-0095		
19	RUS-0010		
20 C	RUS-0089		
21	RUS-0087		
22 C	RUS-0104		

ENTER RECORD NUMBER, A, OR U:
YOU MUST MARK ONE OR MORE RULES IF YOU WISH TO
DOWNLOAD INFORMATION TO YOUR PC. TO MARK ONE
RULE, ENTER ITS RECORD NUMBER. ENTER A TO MARK
ALL RULES ON THIS PAGE. ENTER U TO UNMARK ALL.

A "C" MEANS THE TEXT OF A REGULATION IS AVAILABLE ON THE CAAA BBS.
AN "M" MEANS A REGULATION HAS BEEN MARKED FOR INCLUSION IN DOWNLOAD.

ENTER OPTION	TYPE ONE OF THE RECORD NUMBERS LISTED ON THIS PAGE, OR TYPE A OR U. THEN PRESS <ENTER>.
<input type="checkbox"/>	<ESC> TO ABANDON <F1> FOR HELP

Figure 1: Example of VIEW REGULATION LIST Screen

SMALL BUSINESS UPDATE

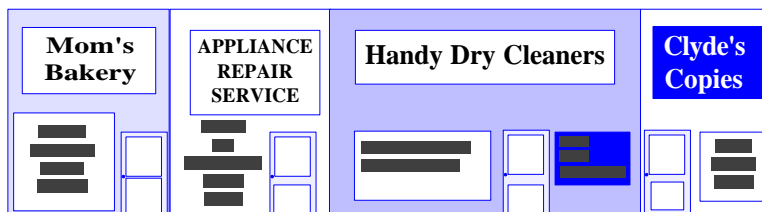
Deborah Elmore, Federal SBAP Coordinator, CTC/OAQPS

If you have received copies of the EPA brochure "New Regulation Controlling Air Emissions from Chromium Electroplating and Anodizing Tanks" (EPA-453/F-95-001), please stop distribution of these materials immediately!

The information concerning the regulation and its require-

ments is correct, however, an error was discovered in the text due to a copyright issue. A revised version is available for downloading from the CAAA BBS on the OAQPS TTN. If you

have any questions, or would like to receive a hard copy of the revised brochure, please call the CTC HOTLINE.



AMMONIA CONTROL

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smaller ammonia sources.

Wet scrubbers are the most common control technique used for ammonia with demonstrated efficiencies up to 99%. Scrubbers are commonly used by the fertilizer, livestock management, and coke by-product manufacturing industries. Although these industries tend to be large sources of ammonia, wet scrubbers are available to treat air emission streams as low as 1 cfm.

Condensate strippers are the second most popular control device; however, in many cases they are considered as an intrinsic part of the manufacturing process rather than an add-on control device. Strippers remove ammonia and return it back to the manufacturing process to reduce the need for raw input materials. This recycling technique is commonly used in the fertilizer industry and in refrigeration units.

P2 techniques used to prevent ammonia emissions include recycle, limiting ammonia/urea use to control NOx from combustion sources, capture devices, and implementing good maintenance practices. Capture systems play a critical role in collecting ammonia emissions for treatment or recycle, as demonstrated in coke by-product facilities and refrigeration systems. These same two source categories offer good examples of good maintenance practices; that is, they ensure that equipment is maintained at a quality operational level to minimize leaks and production losses.

For the post-combustion NOx control technologies of selective catalytic reduction (SCR) and selective non-catalytic reduction (SNCR), when either ammonia or urea is used as the reducing agent, ammonia may be emitted with effluent steam (often referred to as ammonia slip). This condition can be minimized by good equipment operation practices and by limiting the amount of reducing agent added to the amount required to meet permit and operational requirements.

If you would like to get a copy of this report, you can download it from the CTC BBS. Government agencies can get a hard copy by calling the CTC

HOTLINE. Others can purchase hard copies through the National Technical Information Service (NTIS) by calling (800) 553-6847. ■

TECHNOLOGY NOTEBOOK: HAP-PRO Version 2.0, Transferring Disk Copies

Joe Steigerwald
CTC/OAQPS

The Hazardous Air Pollutant-Program (HAP-PRO) is currently available from the Downloading Area of the CTC BBS. The downloadable file is very large (1.77 MB) and some users have been having problems transferring it from one PC to another. (A two-disk version of HAP-PRO Version 2.0 will be made available through the National Technical Information Service (NTIS) in the near future, but it is not available yet.) One may think that the program could not be transferred from the computer on which it was downloaded unless you were to generate your own floppy disks from the installed files. However, there are better ways!

The best way to transfer this or any large file(s) between computers is to use PKZIP, the program you use to expand files you download from the OAQPS Technology Transfer Network Bulletin Board System (TTN BBS). Please remember, the copy of PKZIP that you downloaded from the TTN BBS is free as long as you only use it to zip and unzip files either going to or downloaded from the OAQPS TTN BBS.

PKZIP has an option, the "-&" option, to compress a large, or numerous small or large files, onto multiple diskettes. The format for the command is:

```
prompt>PKZIP -& <drive>:zipfile  
filename1 filename2 .....
```

where: <drive> =the drive letter of the destination diskette
zipfile =the name you assign the new compressed file that you create;
filename1, etc =the name(s) of the file(s) you wish to

compress or any 'wildcard'

(If your interested in PKZIP options, you can get a complete list of PKZIP options by going into a directory that has PKZIP.EXE in it and typing: prompt>PKZIP. This will display the format of the command options and indicate ways to see other options, including the spanning option discussed below.)

As an example, if you are transferring a file called HAPPRO2.EXE, and you choose to call the zipfile "HP2.ZIP," (NOTE: the "ZIP" extender indicates a compressed file) the PKZIP command to compress it to the A drive would be:

```
prompt>PKZIP -& A:HP2.ZIP HAPPRO2.EXE
```

When executed, the computer would prompt you to put a diskette in the A drive, write as much as would fit, prompt you for a second diskette, and so on until the whole file was compressed onto the A drive. Once you have a copy on diskette, you can put the program/files on any PC by putting the first diskette in the A drive (or whatever drive letter is appropriate) and typing:

```
prompt>PKUNZIP <drive>:zipfile
```

In our example, this would be:

```
prompt>PKUNZIP A:PH2.ZIP
```

The computer will examine the file and prompt you to swap diskettes. Remember, you need to have a copy of PKZIP and PKUNZIP for this to work and that the compressed file will expand into whatever directory you are in when you issue the command unless you specify another, with a full path name, in the PKUNZIP command after the zipfile name.

If you have multiple files to transfer, you will also need to know and enter each file name in the "-&" command or use wild cards. The simplest way to do multiple files is to create a directory containing only the files to be transferred and PKZIP. Then type:

```
prompt>PKZIP -& <drive>:filename *.*
```

This will transfer all files in the current directory to the specified drive.

Another way, if both of the comput-

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GENE CRUMPLER: OAQPS ENVIRONMENTAL ENGINEER

As an environmental engineer within EPA's Office of Air Quality Planning and Standards (OAQPS), Gene Crumpler is currently leading the development of MACT standards for the wood preserving and the primary copper smelter industries. Gene joined OAQPS four years ago, moving from Washington, D.C. to Durham, NC in the process. He worked for the EPA for fifteen years in Washington, first in the Office of Solid Waste (OSW) for eight years and then in the Office of Water for another six.

In OSW's Hazardous Waste Program, Gene helped the EPA set up evaluation methods for chemical, physical, and biological treatment processes for hazardous wastes. He also authored the 1981 standards for hazardous waste incineration. During his tenure with OSW, he contributed to almost 40 papers and presentations dealing with hazardous waste.

Following a two-year stint as a consultant outside of government, Gene joined EPA's Office of Water. While there, he concentrated on developing regulations for incineration of sewage sludge. He wrote and collaborated on 18 papers and presentations regarding municipal wastewater sludge during these years. While in the Office of Water, he also contributed to EPA's Ocean Incineration Regulatory Program.

Upon moving to the Durham office, Gene began working in different regulatory areas. He moved away from waste incineration and now studies other areas of air pollution relating to specific industries. The change in his work assignments, he admits, was dif-

ficult but exciting. "I find it challenging," Gene said, referring to his new industry areas. "When I came here, I came into new areas. I felt it was a professional challenge to get up to speed."

Gene's ability to move to new areas within EPA comes from his earlier work as an engineer in the industrial sector. Between 1963 and 1975 he worked for three industrial firms. This included work in the chemical and the synthetic fiber industries. Also, from 1983 to 1985 he served as a project manager for an



environmental consulting firm in Virginia. This varied experience, Gene explained, is part of the reason the EPA hired him in 1975 and again in 1985. "It gives me a perspective on what Industry has to deal with to meet standards," he said, "and it allows me to have

a more rounded viewpoint."

When asked what his lasting contribution to EPA will be, Gene pointed out that his work is far from over. However, he does admit that his work with waste incineration development and regulation during the '80s was an important project for him. The importance of his work seems to be a key element in Gene's decision to first join and then stay with the EPA. In 1975, he was looking "to do something of more significance, (something with) more of a personal impact on people." The EPA afforded him that opportunity.

Outside of the EPA building, Gene can be found on the golf course, practicing a skill that he is "continually working on." The Research Triangle Park area (Raleigh, Durham, and Chapel Hill, NC), he notes, allows him to lead a life-style that is less stressful than the frantic pace of Washington, D.C. His other hobbies include photography. He does his own darkroom work and is an active member of the Chapel Hill Camera Club. Gene also tutors middle school students in math, giving them personal

attention and one-on-one guidance.

Gene was born and reared in Roanoke, Va., and attended school at Virginia Polytechnical Institute, where he received a B.S. in Chemical Engineering. He has three grown children and one grandchild.

TECH NOTEBOOK

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ers involved have DOS version 5.0, is to transport HAP-PRO by using the DOS command "BACKUP" and then use the DOS command "RESTORE". The easiest way is to use the BACKUP command on the 1.7MB compressed HAP-PRO file (or any file in the form filename.ZIP) you download from the BBS. (You can use the decompressed files too but you'll need a lot more diskettes.) Check your DOS 5.0 documentation for the exact format and use of this command.

Finally, an individual called to say that he was having trouble installing a copy of HAP-PRO Version 1.0 which he purchased from a commercial firm for \$50.00. We solved his installation problem and made him aware of the CTC BBS on the TTN where anyone can get (for free) the latest versions of all CTC software. The list of CTC software now includes the Surface Impoundment Modeling System (SIMS), the Landfill Air Emissions Estimation Model (Landfill), the Hazardous Air Pollutant Program (HAP-PRO), and the Solvent Alternatives Guide (SAGE). All are available for download without cost (except for the telephone call) from the CTC BBS. The CTC BBS is available via the OAQPS TTN 24 hours a day (except Monday from 8 - 12 A.M.). See CTC BBS on back page for more information.

(PS - Remember to download the user's manuals for the software, too. Most of your installation and use questions will be answered in there!)

Control Technology Center NEWS

The CTC NEWS is a quarterly publication of the U.S. EPA's Control Technology Center (CTC). The CTC is an informal, easy-to-use, no cost, technical assistance service for all State and local (S/L) air pollution control agency and EPA Regional Office staffs. For others, some services may be on a cost reimbursable basis. The CTC offers quick access to EPA experts and expertise via the CTC HOTLINE and the CTC Bulletin Board, and in-depth technical support through source specific Engineering Assistance Projects or more generic Technical Guidance Projects. The CTC is operated by the Air and Energy Engineering Research Laboratory, Office of Research and Development, and the Information and Program Integration Division, Office of Air Quality Planning and Standards in Research Triangle Park, North Carolina.

If you have any air pollution emission or control questions, or would like more information about the CTC and the types of technical assistance available, CALL THE CTC HOTLINE!

(919) 541-0800

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CTC ASSISTANCE

CTC HOTLINE: CALL (919) 541-0800 to access EPA expert staff for consultations, references to pertinent literature, or access to EPA technical data and analyses. No question is too simple! Our Fax numbers are (919) 541-0242 or (919) 541-0361.

ENGINEERING ASSISTANCE PROJECTS: If you need in-depth assistance concerning a specific control technology problem, call the HOTLINE or write the CTC. EPA staff and contractors are available for short-term projects such as review of proposed or existing control technology applications. Projects are subject to CTC Steering Committee approval.

TECHNICAL GUIDANCE PROJECTS: If the CTC receives a number of similar HOTLINE calls or a joint request from a group of agencies, the CTC Steering Committee may undertake broad, long-term projects of national or regional interest. The result may be a control technology document for a particular type of source, microcomputer software, or seminars and workshops.

CTC BBS: Call (919) 541-5742 for up to 14400 baud modem to access the CTC Bulletin Board. Set communications parameters to 8 data bits, N parity, and 1 stop bit, and use a terminal emulation of VT100, VT102, or ANSI. You may leave HOTLINE requests, order documents, suggest projects, and download software. The BBS is part of the OAQPS Technology Transfer Network (TTN).

FEDERAL SMALL BUSINESS ASSISTANCE PROGRAM (FSBAP): Call the CTC HOTLINE to access the FSBAP. The CTC is the focal point for coordination of efforts among the four EPA centers participating in the program. The Federal program is intended to support State Small Business Assistance Programs, as required by the Clean Air Act.

RACT/BACT/LAER CLEARINGHOUSE (RBLC): The RBLC data base (BLIS) is available on the OAQPS TTN BBS. (See the CTC BBS for connection information.) The Clearinghouse provides summary information for control technology determinations made by permitting agencies.

INTERNATIONAL TECHNOLOGY TRANSFER CENTER FOR GLOBAL GREENHOUSE GASES (ITTCGGG): Call the CTC HOTLINE to access ITTCGGG information on greenhouse gas emissions, prevention, mitigation, and control strategies.



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