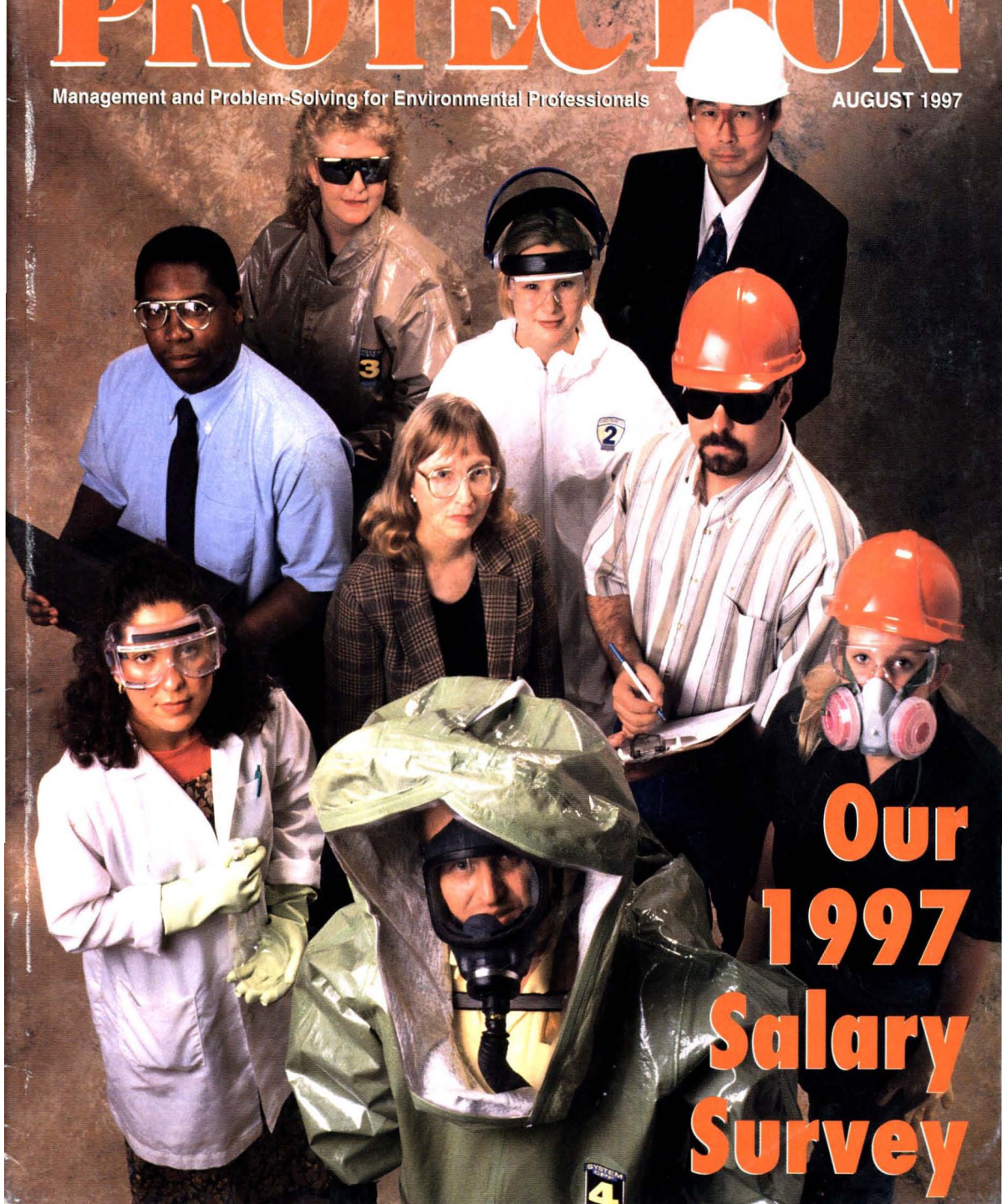


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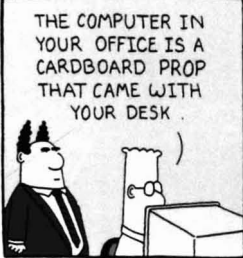
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| 102 | 119 | 136 | 153 | 170 | 187 | 204 | 221 | 238 | 255 | 272 | 289 | 306 | 323 | 340 | 357 | 374 | 391 |
| 103 | 120 | 137 | 154 | 171 | 188 | 205 | 222 | 239 | 256 | 273 | 290 | 307 | 324 | 341 | 358 | 375 | 392 |
| 104 | 121 | 138 | 155 | 172 | 189 | 206 | 223 | 240 | 257 | 274 | 291 | 308 | 325 | 342 | 359 | 376 | 393 |
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A. Function which best describes your activity

In Pollution Control (check only one):

A Corporate responsibility for Pollution Control

B Manage all Pollution Control Operations at this location

C Supervise sub-group in Pollution Control Operations

D Provide professional consulting service on Pollution Control

E Provide staff environmental service on Pollution Control

Z Other _____

B. Type of Business (check only one):

A Manufacturing. If manufacturing, please check the appropriate SIC (check only one):

(20) Food (31) Leather

(21) Tobacco (32) Stone/Clay/Glass

(22) Textile (33) Primary Metal

(23) Apparel (34) Fab. Metal

(24) Lumber & Wood (35) Mach., except Elect.

(25) Furniture (36) Elect. & Electron Mach.

(26) Paper (37) Trans. Equip.

(27) Print/Publish (38) Instr./meas./analyze

(28) Chemicals (39) Misc./other

(29) Petrol. & Coal (30) Miscellaneous Mfg.

(30) Rubber/Plastic

B Mining L Consulting

C Agriculture M Insurance

D Engineering & E Utilities, public, Contracting private & cooperative

F Govt. including municipal or district sanitary water or wastewater treatment sys. or plants

Type of Govt: G City H County

I State J Federal

K Transportation

N Labs O Training P Real Estate

Z Misc. Services

C. Approximate number of employees at this address (check only one):

A 1-19 D 100-249 G 1000-1499

B 20-49 E 250-499 H 1500-2499

C 50-99 F 500-999 I 2500 and up

D. In your job function do you recommend, specify or purchase? (check all that apply)

A Pollution Control Equipment

B Instrumentation

C Chemicals

D Parts & equipment for maintenance operation and control

E Services/Consulting

F None of the above

E. What types of Pollution Control are you responsible for? (check all that apply)

A Air F Toxic & hazardous material

C Noise G Energy control/Disposal

D Solid Waste energy conservation

H None of the above

E Industrial hygiene

F. Which of the following publications do you receive personally addressed to you? (check all that apply)

A Pollution Engineering

B Environment Today

C Environmental Solutions

D Pollution Equipment News

E The National Environmental Journal

F Water Environment & Technology

G None of the above

**Environmental
PROTECTION**

G. Which of the following Pumps, Piping and Valves product(s)/services do you plan to purchase in the next 12 months?(Select all that apply)

800 Centrifugal Pumps

801 Diaphragm Pumps

802 Sewer Pipes

803 Water Pipes

804 Airlock Valves

805 Plug Valves

806 Pinch Valves

807 Check Valves

808 Ball Valves

809 Butterfly Valves

810 Gate Valves

811 Flow Meters

812 In-line Filters

813 Chemical Metering Pumps

814 Drum Pumps

815 Sludge Pumps

816 Progressing Cavity Pumps

817 Grinder Pumps

818 Plastic Pumps

819 Sewage Pumps

820 Submersible Pumps

821 Water Pumps

822 Ductile Secondary Contained Pipes

823 Ductile Iron Pipes

824 Fiberglass Pipes

825 PVC Pipes

826 Stainless Steel Pipes

827 Plastic Pipes

828 Pipe Locators

829 Steel Pipes

H. What is your reason for purchasing the selected products/services? (Select one)

830 New Construction

831 Plant Upgrade

832 Replacement/Maintenance

I. What is your projected budget for the selected products/services? (Select one)

833 Over \$200,000

834 \$100,001-\$200,000

835 \$50,001-\$100,000

836 \$10,001-\$50,000

837 \$5,000-\$10,000

838 Under \$5,000

J. How immediate is your need for the selected products/services? (Select one)

839 0-3 months

840 4-6 months

841 7-9 months

842 10-12 months

843 Over 12 months

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| 108 | 125 | 142 | 159 | 176 | 193 | 210 | 227 | 244 | 261 | 278 | 295 | 312 | 329 | 346 | 363 | 380 | 397 |
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| 111 | 128 | 145 | 162 | 179 | 196 | 213 | 230 | 247 | 264 | 281 | 298 | 315 | 332 | 349 | 366 | 383 | 400 |
| 112 | 129 | 146 | 163 | 180 | 197 | 214 | 231 | 248 | 265 | 282 | 299 | 316 | 333 | 350 | 367 | 384 | 401 |
| 113 | 130 | 147 | 164 | 181 | 198 | 215 | 232 | 249 | 266 | 283 | 300 | 317 | 334 | 351 | 368 | 385 | 402 |
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| 116 | 133 | 150 | 167 | 184 | 201 | 218 | 235 | 252 | 269 | 286 | 303 | 320 | 337 | 354 | 371 | 388 | 405 |

Interested because of: 95 ■ New Construction 96 ■ Adding Capacity 97 ■ Plant Upgrade 98 ■ Maintenance 99 ■ 1 for 1 Replacement

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**FOR FASTER SERVICE
USE PEEL OFF LABEL**

A. Function which best describes your activity in Pollution Control (check only one):

- A Corporate responsibility for Pollution Control
- B Manage all Pollution Control Operations at this location
- C Supervise sub-group in Pollution Control Operations
- D Provide professional consulting service on Pollution Control
- E Provide staff environmental service on Pollution Control
- Z Other _____

B. Type of Business (check only one):

- A Manufacturing. If manufacturing, please check the appropriate SIC (check only one):
 - (20) Food (31) Leather
 - (21) Tobacco (32) Stone/Clay/Glass
 - (22) Textile (33) Primary Metal
 - (23) Apparel (34) Fab. Metal
 - (24) Lumber & Wood (35) Mach., except Elect.
 - (25) Furniture (36) Elect. & Electron Mach
 - (26) Paper (37) Trans. Equip.
 - (27) Print/Publish (38) Instr./meas./analyze
 - (28) Chemicals (39) Miscellaneous Mfg.
 - (29) Petrol. & Coal (30) Rubber/Plastic

B Mining L Consulting

- C Agriculture M Insurance
- D Engineering & E Utilities, public, Contracting private & cooperative
- F Govt. including municipal or district sanitary water or wastewater treatment sys. or plants

Type of Govt:

- G City H County
- I State J Federal

K Transportation P Real Estate

- N Labs O Training
- Z Misc. Services

C. Approximate number of employees at this address (check only one):

- A 1-19 D 100-249 G 1000-1499
- B 20-49 E 250-499 H 1500-2499
- C 50-99 F 500-999 I 2500 and up

D. In your job function do you recommend, specify or purchase? (check all that apply)

- A Pollution Control Equipment
- B Instrumentation
- C Chemicals
- D Parts & equipment for maintenance operation and control

E Services/Consulting F None of the above

E. What types of Pollution Control are you responsible for? (check all that apply)

- A Air F Toxic & hazardous
- B Water material
- C Noise G Energy control/energy conservation
- D Solid Waste energy conservation
- Disposal H None of the above
- E Industrial hygiene

F. Which of the following publications do you receive personally addressed to you? (check all that apply)

- A Pollution Engineering
- B Environment Today
- C Environmental Solutions
- D Pollution Equipment News
- E The National Environmental Journal
- F Water Environment & Technology
- G None of the above

Environmental PROTECTION

G. Which of the following Pumps, Piping and Valves product(s)/services do you plan to purchase in the next 12 months?(Select all that apply)

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- 801 Diaphragm Pumps
- 802 Sewer Pipes
- 803 Water Pipes
- 804 Airlift Valves
- 805 Plug Valves
- 806 Pinch Valves
- 807 Check Valves
- 808 Ball Valves
- 809 Butterfly Valves
- 810 Gate Valves
- 811 Flow Meters
- 812 In-line Filters
- 813 Chemical Metering Pumps
- 814 Drum Pumps
- 815 Sludge Pumps
- 816 Progressing Cavity Pumps
- 817 Grinder Pumps
- 818 Plastic Pumps
- 819 Sewage Pumps

820 Submersible Pumps

- 821 Water Pumps
- 822 Double Secondary Contained Pipes
- 823 Ductile Iron Pipes
- 824 Fiberglass Pipes
- 825 PVC Pipes
- 826 Stainless Steel Pipes
- 827 Plastic Pipes
- 828 Pipe Locators
- 829 Steel Pipes

H. What is your reason for purchasing the selected products/services? (Select one)

- 830 New Construction
 - 831 Plant Upgrade
 - 832 Replacement/Maintenance
- I. What is your projected budget for the selected products/services? (Select one)**
- 833 Over \$200,000
 - 834 \$100,001-\$200,000
 - 835 \$50,001-\$100,000

836 \$10,001-\$50,000

- 837 \$5,000-\$10,000
- 838 Under \$5,000

J. How immediate is your need for the selected products/services? (Select one)

- 839 0-3 months
- 840 4-6 months
- 841 7-9 months
- 842 10-12 months
- 843 over 12 months

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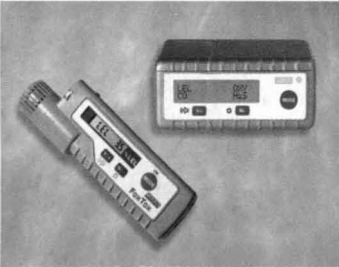
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About the cover:

Changing conditions in the U.S. and foreign pollution control markets are presenting new career challenges and opportunities for environmental professionals. The annual poll we conducted among our readers provides an informative glimpse at salary trends in various segments of the environmental field (see page 14).

Photo by Joe Griffin

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Finding Jobs in the New Economy

"Great news—you're fired! You get a generous severance package, two weeks vacation and we hire you back as a contractor for more money!"

This announcement made to an office mate of Dilbert™, the comic strip technenerd, may sound humorously absurd. Yet, this cartoon scene is a reflection of what's increasingly taking place in corporate America. In many instances, pink slips are becoming tickets to higher pay as downsized employees resurface as consultants.

Nowadays environmental professionals seeking new employment should be prepared to face unprecedented challenges. The fundamental nature of jobs is changing in the United States and practitioners in the environmental field will have to adapt along with the rest of American workers. Since 1980, our national economy has lost about 43 million jobs due to layoffs. In the same period, 71 million new jobs have been created for a net gain of 28 million jobs.

Several strong trends have given rise to this massive restructuring, which many experts are calling the "new economy." Current dominant drivers in business include globalized markets, outsourcing, using temporary workers, doing more with less and increased expectations because of rapid technological gains. Added to this is the rise of customer-driven markets and a quickly transforming regulatory environment.

From the employees' perspective, so much change can be unsettling. Downsizings have jarred most employee's psyches and they realize that their greatest job security is marketable skills. The best jobs in the new economy are going to highly educated and specially skilled workers who are able to adapt.

Professionals will no longer be able to put down the text books on graduation day from college. In the coming years, employees will constantly have to develop new skills just to keep up.

But with change can come opportunities. Many specialists in hazardous waste remediation are cleaning up financially because they switched from Superfund sites to brownfields. And environmental professionals willing to tackle new cultural climates are profiting from lucrative foreign markets for environmental goods and services. With determination and a little creativity, motivated environmental job seekers should be able to successfully find employment in the new economy.

Help for EH&S Managers

A quick survey of many current job listings shows that combination environmental, health & safety (EH&S) managers are in growing demand. In April, our editorial staff introduced a new publication, *EH&S Products*, to help these busy professionals maximize their time. The next issue will accompany *Environmental Protection* in September so check it out for the hottest new environmental and safety products.

Angela Neville

Angela Neville, JD, REM
Editor, *Environmental Protection*

Environmental PROTECTION

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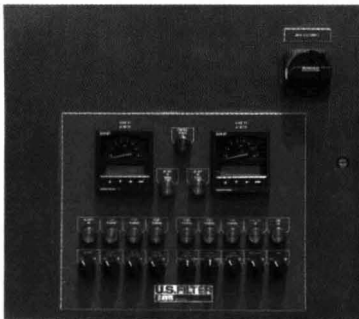
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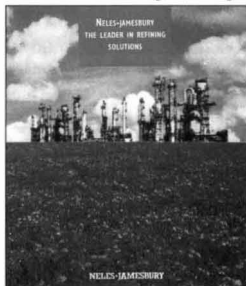


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The Godwin Sub-Prime is an electric submersible dewatering pump, available in 1/2 and 1 horsepower. The compact, lightweight and durable design is suited for construction, industrial, mining and municipal dewatering. **Godwin Pumps of America Inc.**

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Wastewater Pump

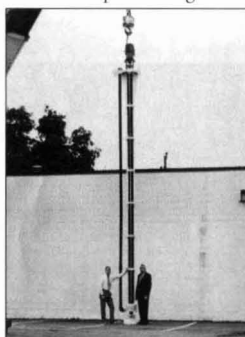
The energy-saving KL85 and KL86 wastewater pumps



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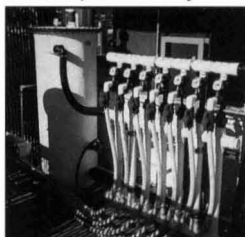


the Vortex pump handles corrosive and abrasive fluids containing stringy materials and solids as large as 3 inches in diameter. Rated 900 GPM at heads to 220 feet at temperatures to 275 degrees Fahrenheit. **Vanton Pump and Equipment Corp.**

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Multi-Well Jet System

The EconoPump Multi-Well Jet system runs up to



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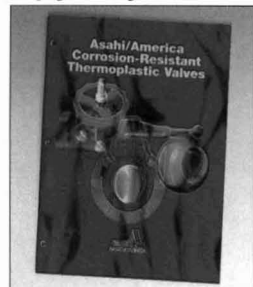
The NEMO® NESP Series progressing cavity pumps mix, blend and transport dewatered sludge. Eliminates conveyor mess and odors

while reducing installation and maintenance costs. Features include: open-throat suction housing, reaking/mixing paddles, feeding auger and pumping elements. **Netzsch Inc.**

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Thermoplastic Valve

Asahi/America released a 52-page catalog for its line of

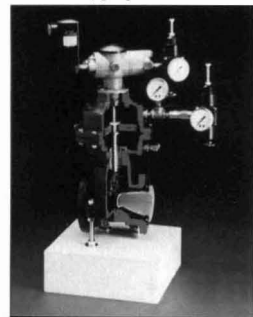


corrosion-resistant thermoplastic valves. Valves included are numerous styles of ball, butterfly, diaphragm, check, gate, pressure relief and sight-gauge valves, pneumatic and electric actuators and sediment strainers **Asahi/America Inc.**

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Enclosed Pinch Valve

The Flex-Valve 6000 Series enclosed-type pinch valves are



suitable for adaptation to most actuators for on/off or modulating service. Actuation choices include: handwheel, diaphragm, air cylinder, electric and hydraulic. Available in standard and heavy-duty configurations. **Flexible Valve Corp.**

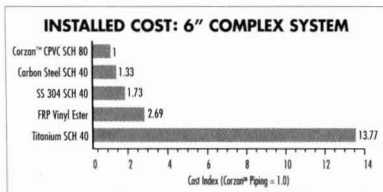
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Recycling Boosts Economy

DES MOINES, Iowa – According to an Iowa Economic Impacts of Recycling Study, recycling is good for Iowa's economy. Among some of the report's findings, the processing sector of Iowa's recycling materials provides the greatest economic impact to the economy. Also, the study concluded that for every job created in Iowa's recyclable materials processing sector, one additional job is created in the remainder of Iowa's economy. The end-use manufacturers of Iowa's recyclable materials provide the greatest economic value to the economy. In 1995, end-use manufacturing resulted in \$359.5 million in total income and 8,800 jobs.

Other key findings in the study show that 1,290 new jobs are created yearly, \$100.3 million in fees and taxes are paid to state and local governments, and every dollar generated by recycling processing brings 97 cents in other parts of the economy.

In Situ Remediation Technologies

WASHINGTON, D.C. – The U.S. Environmental Protection Agency released a report, *Recent Developments for In Situ Treatment of Metal Contaminated Soils*. The report provides hazardous waste cleanup professionals with an update on available and promising technologies for *in situ* remediation of soil contaminated with heavy metals. The document provides an overview of four promising technologies for *in situ* soil including phytoremediation, electrokinetics, soil flushing and solidification/stabilization.

In general, *in situ* remedies are most cost effective when compared with traditional treatment technologies. Phytoremediation is the use of plants and trees to clean up contaminated soil and water. Electrokinetics is the use of a low-intensity direct currents between electrodes placed in the soil. The contaminants are then mobilized and removed from the soil for treatment. The soil flushing technology involves extraction of contaminants from soil using water or other suitable aqueous solutions. The solidification/stabilization process changes the physical and chemical characteristics of the waste to immobilize the contaminants. A second solid-

ification technique involves using an electrical current to pass between electrodes to melt soil and incorporate metals into a solid product.

For copies of the report, call the National Center for Environmental Publications and Information at (513) 489-8695.

Landfill Volumes Decrease

MINNEAPOLIS – An annual survey of hazardous waste landfills by Environmental Information Ltd. recorded a drop in the amount of waste received by such facilities for the second year in a row. In 1996, the 21 permitted and operating landfills in the United States and Canada took in approximately 2.63 million cubic yards of hazardous waste – almost 3 percent less than they received in 1995. Eight of the landfills reported a decrease in volume from 1995 to 1996.

Ozone Now Approved for Food Industry

PALO ALTO, Calif. – Experts from food science, ozone technology and other related fields declared Generally Recognized as Safe (GRAS) status for ozone use in food processing. The U.S. Food & Drug Administration (FDA) allows independent affirmation of GRAS status of substances by a qualified panel of experts. The Electric Power Research Institute (EPRI) requested an independent contractor to review the history and health aspects of ozone for possible use in processing foods for human consumption and for GRAS status.

Ozone is produced by means of an electric discharge through air or pure oxygen that is passing between concentric tubular electrodes. The ozone-enriched gas is then bubbled through water and the residual ozone is destroyed.

After an initial meeting with the FDA, an expert panel of six scientists met frequently over the course of a year to interpret and evaluate the history of ozone. Findings include:

- ozone has been shown to be a more powerful disinfectant than chlorine;
- ozone has been used safely and effectively in water treatment for 90 years and has been approved in the United States as a GRAS for treatment of bot-

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- Hazardous Waste

tled water since 1982;

- ozone has been used in the food industry in Europe for decades; and
- ozone does not remain in water.

The Future of Fridges

WASHINGTON, D.C. – According to a new rule announced by the Clinton administration, refrigerators manufactured or imported in the United States after July 1, 2001, must use up to 30 percent less energy.

The standard was crafted by the U.S. Department of Energy (DOE) and reflects a consensus among a broad coalition of appliance manufacturers, environmentalists, states, utilities and consumer groups. The new generation of refrigerators will cost less to operate, saving consumers \$1.1 billion annually by 2010, without sacrificing size, features or convenience.

Cost of the more efficient refrigerator is expected to increase by \$80.00. The

typical consumer will save \$20.00 per year from the electricity savings, recovering the increase in cost in four years. Over the 19-year life of the refrigerator, consumers will have a net savings of \$300.00, according to DOE estimates.

Congress' Recycling Program

WASHINGTON, D.C. – The Democratic Policy Committee of the U.S. House of Representatives charged recently that Congress' recycling program has been neglected by Republican leaders because of the reduction in materials being recycled. From 1994 to 1996, aluminum can recycling in the House fell 74 percent, glass bottle recycling fell 83 percent, and paper separation efforts are a mess due to contamination.

The U.S. General Services Administration (GSA) reports that, due to contamination of recyclables, the House received only 39 cents per ton for its paper in 1996 compared to \$42 per ton received by the U.S. Department of Energy and \$60 per ton received by the U.S. Department of Housing and Urban Development. If recycling in the House had been as efficient as the DOE's program, Congress would have recovered \$137,146 last year instead of \$4,974.

According to the GSA, the Senate fared little better than the House last year, receiving only \$4.39 per ton for its recycled paper. House Democrats urged Republican leadership to pass HR 119, a resolution to make recycling in the House of Representatives mandatory. **EP**

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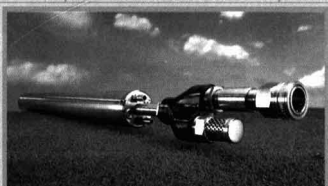
it's the first \$1,095 pump with a free 2-year warranty.

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the industry. Other manufacturers have tried to

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Correction for June 1997 Issue

The author would like to make the following changes to the article, "Surfer's Guide to the EPA Online," that was published in EP's June 1997 issue:

- Page 23: "Transport" should read "Transfer."
- Page 25: "(Attic) should read (ATTIC)
- Page 25: "E-mail to LISTSERV@s@" should read "E-mail to listserver@."

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1997 SALARY SURVEY

*EP checks out environmental professionals' wages
in today's demanding business climate.*

By Angela Neville

Miss Manners™ would probably say it's bad taste to snoop around trying to find out how much money other people make at their jobs.

Yet, inquiring minds like yours want to know what your fellow environmental professionals are earning. Which types of workers in the environmental field are the best paid? Where in the United States are professionals earning the highest incomes? How much do varying levels of formal education affect people's salaries? What economic trends are impacting wages? No doubt questions like these have crossed your mind if you're planning to switch jobs or just want to see how your present salary stacks up against those of your peers.

But, short of brazenly asking your colleagues about their salaries while hanging out at the company snack bar or surreptitiously plundering their desks in search of paycheck stubs, it's hard to obtain such sensitive information. That's where we can help you by getting answers to your questions in an "etiquette-correct" way.

To accomplish this, we conducted our 1997 salary survey and asked the readers of the April *Environmental Protection* to complete a one-page questionnaire. More than 300 readers replied and we crunched the numbers to come up with a profile of the current salaries for professionals working in the areas of hazardous and solid waste, air, water and wastewater and health and safety (see **Figure 1**).

For those of you looking at the survey to compare where you stand, please note that this should not be considered a statistically valid survey, but rather an informal representation of *EP's* readership.

Employment Factors

Our survey focused on factors like job titles, type of work, educational background, geographical region and gender that can impact the amount of compensation environmental professionals receive for their services.

Although out of necessity we often lump our readership together under the common name of "environmental pro-

**More than 300 readers
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the areas of hazardous
and solid waste, air,
water and wastewater
and health and safety.**

fessionals," the people who participated in the survey have job titles that are surprisingly diverse, which reflects the wide variety of professionals who now have to deal with environmental issues. Their job titles included project manager, trainer, scientist, engineer, health/safety supervisor, regulatory compliance specialist, consultant, industrial hygienist, corporate manager, laboratory manager, human resource director, watershed manager, emergency response coordina-

tor, technical sales representative, meteorologist, technical writer and registered nurse.

To cover the main occupational groups in the environmental field, the questionnaire asked the participants to place themselves in one of several broad workplace categories: manufacturing, utilities, government, water treatment facilities, municipal landfills, academia, consulting firms and "other" entities. The survey results show the highest paid groups were professionals employed at municipal landfills, who earned an average income of \$67,250 per year, and those worked for utilities and earned on the average \$66,051.

The people who listed working in "other" types of workplaces including a treatment, storage and disposal facility, a union training facility, an environmental laboratory, the pipeline industry, a public health agency, an air cargo freight warehouse, a commercial real estate agency, a metal cleaning facility and a hospital.

The level of formal education certainly played a key role in our readers' salaries. As we expected, the highest wages went to the people surveyed who held doctorates, with the highest annual average income (\$91,746) in the hazardous materials (hazmat) handling category and the lowest average income (\$61,119) in environmental, health and safety (EH&S). Yet, even people who listed high school diplomas as their highest degrees made quite respectable salaries, ranging from a yearly average of \$41,934 in the hazmat area to an average of \$46,600 in the solid waste field.

The geographical locations of the survey participants appeared to have only minor effect on their incomes. Environmental professionals in the

Northeast had the highest average salaries (\$54,941) and people working in the South had the lowest (\$53,636).

In contrast, gender seemed to greatly impact the salaries of the readers polled. Of the 330 people who responded to the survey, only 56 were females. In each category, hazmat, solid waste, air, water and EH&S, women earned substantially less than men. The most extreme case of gender-based income disparity was in the area of water treatment with women earning annual salaries that averaged \$13,271 less than their male counterparts for the same types of jobs.

Trends Impacting Salaries

We also gave our readers an opportunity to sound off about present conditions

they see affecting environmental professionals' incomes.

We received numerous comments about the current stagnation of the environmental field. According to Ed Currie, a regulatory compliance specialist who works for a government agency that serves Florida, Puerto Rico and the U.S. Virgin Islands, "The current glut of available environmental professionals is due to mergers, downsizing and regulatory program changes. [Another factor is] maturing compliance programs."

In the same vein, Dave Kafure, a Wisconsin regulatory compliance specialist who focuses on hazardous waste, commented, "Tax cuts and reduced government budgets are impacting governmental environmental professionals.

Relaxed environmental cleanup requirements are affecting consultants' billable hours."

Helga Mayhew, an engineer in Iowa who specialized in solid waste, said, "Too many small firms specializing in just a few services are underbidding larger, established consulting firms."

Despite the somber reflections of many survey participants, others pointed out some positive trends in the field. Mike Thoyer, a regulatory compliance specialist in Oklahoma, stated, "As environmental laws and regulations become more stringent, we should command higher salaries."

Echoing such sentiments, Michael Kerr, an Ohio regulatory compliance specialist, said, "Hopefully, as the disci-

Figure 1

| WORKPLACE | HAZ MAT | SOLID WASTE | AIR | WATER | EH&S | OTHER | NONE |
|----------------------------|------------|-------------|------------|------------|------------|------------|------------|
| Manufacturing | \$55171.31 | \$55009.65 | \$56238.69 | \$54280.35 | \$51233.33 | \$53817.75 | \$49348.55 |
| Utility | 67500.00 | 62250.00 | 66166.67 | 71285.00 | 59500.00 | 69604.00 | # |
| Government | 51744.75 | 47231.65 | 52268.78 | 45878.13 | 69327.86 | 54378.57 | 60800.00 |
| Water Treatment Facility | # | *65000.00 | 73000.00 | 45273.00 | *51000.00 | # | *73000.00 |
| Municipal Landfill | *67500.00 | 66250.00 | *67500.00 | *67500.00 | 67500.00 | # | # |
| Academia | 52000.00 | # | 48000.00 | 67500.00 | 45000.00 | 67500.00 | # |
| Consulting Firm | 57986.77 | 54805.89 | 54698.46 | 58051.58 | 45000.00 | 58318.67 | *46500.00 |
| Other | 51451.54 | 51610.91 | 56557.14 | 49371.00 | 44430.91 | 66000.00 | 59600.00 |
| EDUCATION | | | | | | | |
| High School | 41934.00 | 56600.00 | 42766.67 | 42779.75 | 42000.00 | # | *32000.00 |
| Bachelors | 50744.72 | 50212.54 | 53106.38 | 49328.77 | 47861.20 | 53933.33 | 52989.63 |
| Masters | 61410.48 | 61832.74 | 60899.35 | 59053.21 | 61108.62 | 59516.41 | 64083.33 |
| Doctorate | 91646.00 | *65238.00 | 70746.00 | 69647.60 | 61119.00 | 75000.00 | # |
| Other | 56837.50 | 65250.00 | 58750.00 | 70000.00 | 40885.40 | 53666.67 | # |
| EXPERIENCE IN YEARS | | | | | | | |
| 0 to 5 | 41483.04 | 45041.84 | 41073.00 | 39655.80 | 43339.32 | 35671.43 | 43358.50 |
| 6 to 10 | 49650.45 | 50091.67 | 53325.79 | 48579.55 | 53977.00 | 45226.15 | 52753.08 |
| 11 to 20 | 60568.67 | 57865.38 | 56725.00 | 56433.48 | 53671.11 | 56806.33 | 56750.00 |
| 21 or more | 72213.04 | 66721.43 | 70257.89 | 68868.33 | 70125.00 | 78729.88 | 64666.67 |
| PEOPLE SUPERVISED | | | | | | | |
| zero | 51204.74 | 52208.72 | 56175.27 | 47708.86 | 44458.33 | 45745.45 | 48400.00 |
| 1 to 5 | 53148.88 | 51058.56 | 51880.62 | 52569.32 | 50528.02 | 58179.88 | 57363.64 |
| 6 to 10 | 58860.00 | 59375.00 | 67866.67 | 60450.00 | 59120.00 | *72000.00 | *51000.00 |
| 11 to 20 | 72450.00 | 72550.00 | 70675.00 | 61734.67 | 69000.00 | 63604.00 | 70000.00 |
| 21 to 50 | 70547.00 | 80333.33 | 88333.33 | 64045.83 | 49000.50 | 81666.67 | # |
| 51 or more | 64000.00 | *48000.00 | *48000.00 | 68750.00 | 79333.33 | # | *70000.00 |
| REGION | | | | | | | |
| Midwest | 52479.00 | 54110.00 | 56789.00 | 57157.00 | 54985.00 | 52628.00 | 54241.75 |
| Northeast | 54521.39 | 54397.38 | 52715.36 | 54406.77 | 56158.72 | 56808.84 | 55583.33 |
| South | 56352.86 | 53265.67 | 55459.26 | 50266.79 | 45207.94 | 58100.00 | 56800.00 |
| West | 54185.95 | 53920.00 | 54633.33 | 53195.83 | 47885.00 | 61649.50 | 53633.33 |
| All | *55000.00 | *55000.00 | 77500.00 | *55000.00 | # | *65000.00 | *52000.00 |
| No response | 68500.00 | *60000.00 | 65000.00 | 64000.00 | *35000.00 | # | # |
| GENDER | | | | | | | |
| Female | 43864.92 | 47053.56 | 47475.50 | 41985.09 | 42015.83 | 45154.09 | 45716.67 |
| Male | 56885.44 | 55716.31 | 56988.58 | 55255.86 | 53039.92 | 58417.31 | 58237.29 |

* Denotes only response in this category

The regions include the following states — Midwest: ND, SD, NE, KS, MN, WI, IA, IL, IN, OH; Northeast: ME, VT, NH, MA, NY, CT, NJ, PA, MD, WV, DE, RI; South: TX, OK, AR, MO, LA, MS, AL, TN, KY, NC, SC, GA, FL, VA, PR; West: CA, NV, AZ, NM, CO, UT, OR, WY, MT, ID, WA, AK, HI

pline continues to evolve and be recognized, money will go up."

Several readers who were polled mentioned the new trend of environmental professionals increasingly making corporate management decisions as part of their jobs. Joe Bulzan, a scientist in Ohio who works for a governmental agency, noted two important developments: the growing integration of business concepts with environmental programs and the increasing need for expertise in multimedia programs.

Des Skinner, a corporate environmental manager, said, "I see a change from administering to managing environmental affairs. [The trend is] fewer technical requirements and more managerial."

Other emerging roles for environmental professionals were mentioned by survey participants. Doug Cook, a California project manager, pointed out a strong emphasis on professionals being "rainmakers" who generate new business for their companies. He also noted that knowledge of ISO 14000 and environmental management systems will have

an impact on salaries. In addition, he noted the phenomenon of larger projects and bigger companies.

Sharing the same outlook about the importance of a company's size, Manjunath A. Gokare, an engineer in Georgia, commented, "The future will lie with larger companies that will go global and tap into the Asian infrastructure market."

Tips for Boosting Wages

Some people shared strategies for landing higher salaries. According to Bob Gaspar, a regulatory manager at a manufacturing facility, environmental professionals can expect substantial increases in salaries if they help reduce costs through innovative cost-reduction programs. Along the same lines, Martin Scheerbaum, an Ohio professional engineer, said, "Professionals need to show how their actions and strategies contribute to the success of the business."

Our readers offered other career pointers. Meena Manawani, a California engineer, advised that being involved in

more than one subject makes a person more marketable. Elaborating on that same theme, Betty A. Reatier, a regulatory compliance specialist in Oklahoma, stated that environmental professionals will increasingly have to handle duties related to safety and health, workers' compensation, loss control and risk management.

According to Ronald S. Zitek, an Ohio engineer working at a municipal landfill, "If you're an environmental scientist, find another field or career. If you are an engineer (civil, environmental or geological), you can expect top dollars, as well as bonuses."

Overall, our readers' feedback about the current state of environmental professionals' salaries convinces us that while some segments of the environmental market are indeed slowing down, other areas are growing and offer great opportunities for financial advancement. **EP**

Angela Neville, JD, REM, is the editor of Environmental Protection magazine.

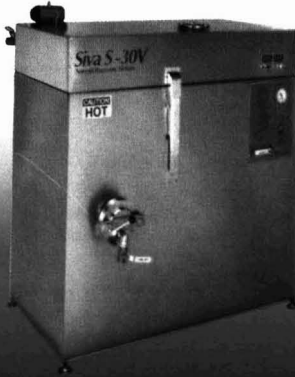
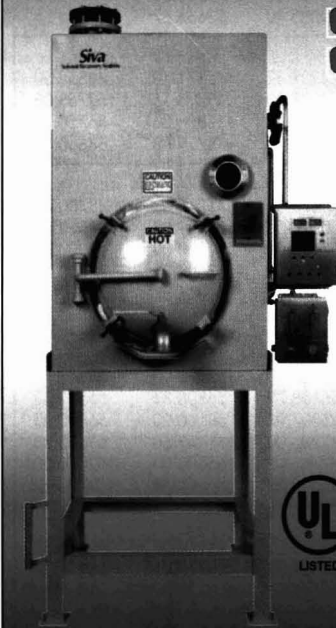
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the grapevine

Foster Wheeler Environmental Corp. in Clinton, N.J., acquired the Seattle-based engineering firm of Hartman Associates Inc.

Chrompack International B.V. in the Netherlands will distribute the Hapsite field-portable gas chromatograph/mass spectrometer for Inficon, the environmental group within Leybold Inficon Inc.

HPS Division of MKS Instruments Inc. received ISO-9001 certification for the Boulder, Colo., facility that manufactures piping, components, valves and gauges for the vacuum industry.

EIS International and EnviroMetrics Software Inc. have merged to form one software company, but will maintain all their current offices.

The U.S. Department of Energy selected Air Products and Chemicals Inc. to head a technology and business team that will develop an ionic ceramic membrane technology to reduce the cost of converting natural gas to synthesis gas for production-grade liquid fuels and premium chemicals.

Flournoy-James Inc., environmental health and safety consultants, added Mary Chambers and Barbara Cavender Lewis to its professional staff in Ruston, La.

Jack Stephens was appointed president of Gas Tech Inc., manufacturer of gas detection instruments in Newark, Calif.

H.E.R.C. Products Inc. has completed a contract with the U.S. Navy to clean the waste water lines, using its proprietary Pipe-Klean® technology, on board the U.S.S. ELROD, a 453-foot Oliver Hazard Perry class frigate.

ABS Pumps Inc. of Meriden, Conn., took over the Sarasota, Fla.-based Framco Environmental Technologies operation.

Dr. Paul Upton was named general manager of Dames & Moore of the Dames & Moore Group's European operations.

AllGro, a division of Wheelabrator Water Technologies Inc., was awarded a contract by the Solid Waste Authority of West Palm Beach, Fla., for biosolids compost marketing.

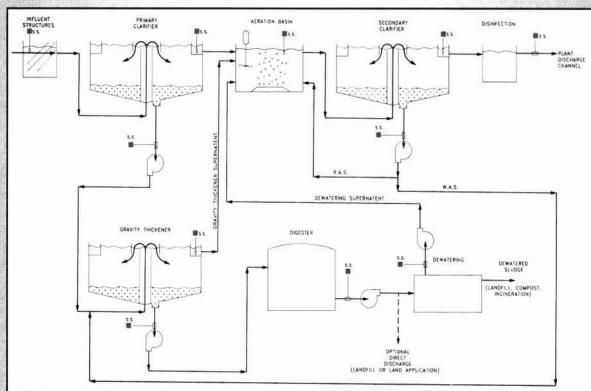
Casper R. Taylor Jr. (D), speaker of the Maryland House of Delegates, was named "Outstanding State Legislator of the Year" by Biotechnology Industry Organization for promoting the continued growth and success of the biotechnology and information technology industries in Maryland.

David W. Carter joined Berryman & Henigar as vice president of finance.

Mobil Business Resources Corp. awarded a \$12 million contract to the Lancaster Laboratories division of Thermo Analytical Inc. to perform analytical chemistry services.

Ciminelli Services Corp., a firm specializing in demolition and asset recovery, hazardous waste remediation and landfill

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construction and closure, established its headquarters in western New York.

Mass Dynamics is the new operating division of **Milltronics Inc.** that focuses on the development and sales of dry solids flow measurement and process protection products.

Columbia Analytical Services Inc., a network of 10 environmental laboratories, announced its independence from EMCON.

ISO 9001 quality certification went to **Pumpex Inc.** for its development, manufacturing, marketing and sales of submersible pumps and accessories.

FiberChem Inc. announced that Dr. Stanley M. Klainer, father of fiber optic chemical sensor technology, has been named Nevada's inventor of the year by the Nevada Technology Council.

Carroll W. Slusher joined **Insituform Technologies Inc.** as director of west regions based in St. Louis.

Matheson Gas Products announced the upgrade of its hydrocarbon production capabilities for high-purity hydrocarbons.

Teradyne Corp. selected **United States Filter Corp.** to provide a complete turn-key system for wastewater recycling and copper recovery at its printed-circuit-board manufacturing facility in Nashua, N.H.

James F. Mattern, PG, regional manager of **Apex Environmental Inc.**'s Pennsylvania office, was elected chairman of the Cleanup Standards Scientific Advisory Board of the Pennsylvania Department of Environmental Protection.

Geraghty & Miller Inc., an international environmental and infrastructure firm, was awarded a contract to provide environmental engineering services for U.S. Coast Guard facilities throughout the country.

Kenton C. Toomey was appointed vice president of operations at **Osmonics Inc.** in Minnetonka, Minn.

Haley & Alderich announced that

Lawrence H. Roth, PE, GE, has joined its San Francisco office as vice president and Richard P. Standish, PG, LSP, has joined its Hartford office as manager of environmental services.

Montgomery Watson Americas appointed Richard Wankmuller to chief operating officer of the company's industrial and federal operations.

Action Instruments announced the addition of Noland Broussard as national sales manager.

Parsons Transportation Group Inc., an industry-leading planning, engineering and construction firm, has named William Crowell as chief environmental planner for the New York City office. **EP**

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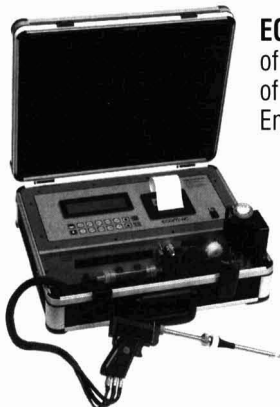
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WHERE THE JOBS ARE

Trends in the environmental industry point out potential career moves.

By Ashley E. Blyth

Publicity surrounding downsizing has created a sense of gloom in the environmental job market. Job hunters can maximize their job searches despite the negative publicity armed with concrete direction from research. Environmental professionals who watch trends in regulations and federal and local government will not only stay in compliance, but will also prepare themselves to pattern career moves after trends in heavily regulated areas.

Always a Need for Environmental Goods and Services

As the environmental industry fluctuates, one area will take precedence over another. Federal and state legislation affects the market's flux. For example, the new Clean Air Act standards for ozone and particulate matter will most likely be enacted by the U.S. Environmental Protection Agency this summer and companies will need qualified staff to ensure compliance and install the air pollution control technology needed to meet the more stringent regulations.

Another example is Vice President Al Gore's announcement of his intent to create a Brownfields National Partnership program that will clean up 5,000 contaminated abandoned manufacturing sites that do not qualify for the Superfund program. Gore wants Congress to pass brownfields legislation giving a \$2-billion tax incentive for redevelopment of the sites to leverage the private sector's \$10-billion spending on 30,000 sites. Gore's Brownfields National Partnership will include \$300 million in spending on cleanup and redevelopment and \$165 million in loan guarantees for use in community developmental efforts. This program is expected to support as many as 196,000 new jobs.

The Environmental Bankers Association in Arlington, Va., is encouraging banks to enlist reputable independent contractors to perform environmental site assessments (ESA) or environmental audits. Because banks and financial institutions may be liable for environmental cleanups if they become the owners or are viewed as being in control or participating in the management of a polluting enterprise or a property that is contaminated, many require an ESA or an environmental audit to consider environmental risks when reviewing credit applications. This continuing trend maintains a comfortable market for reputable independent contractors to perform ESAs.

Positive Business Outlook

The general business outlook for environmental companies in 1997 is an overall positive one. According to an EET Corp. survey of 140 environmental-related businesses with operations in the Oak Ridge/Knoxville,

Photo by Joe Crigfin

Tenn. area, the average expected sales increase is 32 percent higher than 1997. Zweig White & Associates in Natick, Mass., and San Francisco, Calif., released similar data in their 1997 Finance & Accounting Survey of Architecture, Engineering & Planning Firms. According to the survey, firms are projecting revenue with a median growth of 26 percent over the next three years.

"I think the main conclusion that I can draw from the ... data is that the environmental business community as a whole is very optimistic about the future," said Rona Painter, environmental specialist and statistician with EET. "One needs to be careful about analyzing results from surveys of this type, because firms with pessimistic outlooks may be less likely to respond than those with positive forecasts. However, despite this possible effect, the data are convincingly optimistic."

"Despite a tight market, we are still doing a lot of hiring," said Susan Lee, manager of human resources at Environmental Resources Management (ERM) in Exton, Pa. ERM is currently hiring personnel with expertise in the water and wastewater fields. "Water is the new hot topic, when five years ago our clients didn't even want to talk about water," said Lee.

Projected Job-Field Growth

In 1994, chemical engineers held over 50,000 jobs in the chemical, petroleum refining and related manufacturing industries according to The Bureau of Labor Statistics' (BLS) Occupational Outlook Handbook. Industrial engineers held about 115,000 jobs in 1994 in manufacturing industries. The BLS predicts that most job openings in industrial engineering will result from current workers leaving the field or retiring.

About one in five people working as geologists in 1994 worked for oil and gas companies or oil and gas field-service firms. One in seven geologists was self-employed. According to the BLS, recent setbacks in the petroleum industry created a poor job market. The environmental industry has offset the job slump for geoscientists with an increased demand for contaminated site cleanup and to help private companies and government comply with environmental regulations.

Lee supports the BLS data; ERM is hiring entry-level geologists and engineers with zero to five years experience.

Chemists, who held 97,000 jobs in 1994, will find promising job growth through the year 2005 as the chemical industry faces continued demand for pharmaceuticals, personal care products and specialty chemicals. The BLS calculates expenditures in research and development by pharmaceutical and biotechnology firms based on stronger competition among drug companies and an aging population, but job growth is also spurred by the need for chemists to monitor and measure pollutants for regulatory compliance.

The Hottest Areas

As the U.S. Environmental Protection Agency and Occupational Health and Safety Administration work together under President Bill Clinton's recommendation for partnership, environmental, health and safety professionals are in higher demand.

Herb Newman, staffing specialist at Fusion Staffing Services, points out that industrial and environmental, health and safety jobs will continue to grow. Job hunters with skills in industrial hygiene, safety and the environment will find a plentiful market. Many large companies have restructured, putting environmental and safety responsibilities in one department and smaller companies will look for one person to meet both needs in an effort to save money.

Consulting is another hot area in the environmental field. "Compliance and compliance auditing with a long-term view of ISO 14001" maintains the national demand for environmental consultants, according to Newman.

According to Lee, management consulting is expanding, and ERM is hiring to keep up. ERM consultants provide clients with ISO 14000 compliance, environmental site assessments and compliance monitoring.

Some companies have downsized environmental consultants drastically; however, this corporate trend has an upside. Bob Petersen, EET president and chief executive officer, stated that the need for environmental services has not diminished with downsizing, thereby creating a better market for independent contractors.

Environmental Information Ltd. in Minneapolis, tracks environmental consulting firms by EPA regions. According to two EI surveys, 38 percent of the environmental consulting firms in the

four-state EPA Region 10—Alaska, Idaho, Oregon and Washington—closed. Over half of the closures were companies with 25 or fewer employees and had been in business over seven years.

Although Newman has also noticed that corporate consolidation has eliminated some positions, he has seen an increase in small environmental consulting firms. "A lot of people are getting shaken out," he said. "Those who do are finding jobs quicker or are starting their own companies." With more environmental professionals working for themselves in the environmental consulting field, it has become a growing, competitive field.

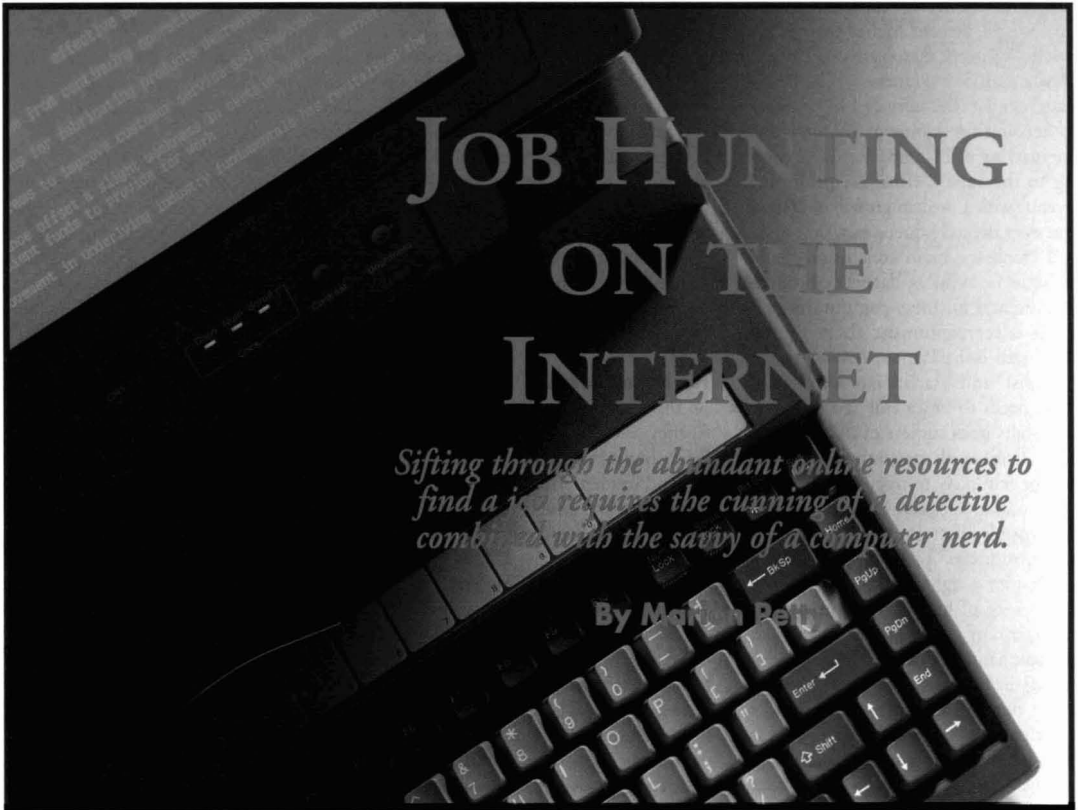
This U.S. trend has created smaller, more competitive consulting firms while big companies take their work overseas. Newman notes that Asia, South America, Europe and Australia are demanding U.S. expertise in environmental fields, especially water and wastewater. Jobs for American environmental professionals willing to work in these countries guiding environmental projects may be created as firms expand world wide.

ERM continues to grow internationally, but instead of moving U.S. citizens abroad, the company hires experts native to the area. Lee explained that this policy is more successful and creates jobs in other countries.

Another field for environmental professionals with excellent communication skills is community relations. ERM offers community-affair services for clients geared toward neighborhood environmental concerns. According to Lee, "That's a department we can't hire fast enough in," on junior and senior levels. Professionals with such skills can also work in public relation firms representing companies with environmental compliance concerns, or in companies with in-house public relations departments to address environmental issues within their areas.

Although workers are threatened by the ebb and flow of corporate America, professionals armed with information about trends in the environmental industry and corporate direction can streamline the search process into a more effective hunt. **EP**

Ashley E. Blyth is assistant editor of Environmental Protection magazine.



One advantage of using the Internet to find a job is that you don't always have to be online to find the perfect position.

There are many career web sites that are interactive and continue looking for you long after you have logged off and gone to bed.

So you've finally made the decision to look for a new job. Your résumé is updated, your power business attire is laundered and your references are expecting the phone to ring. So far, so good. The next step? Most people wait for the Sunday newspaper and devour the classifieds, which are a good start. However, they are not the only game in town. If you have Internet access—and a growing number of professionals do—you can surf your way to a new career.

Have Computer, Will Travel

You will be amazed and probably a little overwhelmed when you find all the pages online dedicated to helping employers and employees find each other. An enormous amount of information is available for job seekers, including how to write a killer résumé, how to anticipate tough interview questions (i.e.: without using any adjectives, describe your work ethic) and how to have positive body language. If you need that kind of help, try out Yahoo's employment page (http://www.yahoo.com/Business_and_Economy/Employment). It has information on salaries, career planning, telecommuting and networking.

However, if you are beyond that point and ready to look for prospective employers, a very nice "toe-in-the-water" approach is to visit Richard Nelson Bolles' site (<http://www.washingtonpost.com/wp-adv/classifieds/careerpost/parachute>). Bolles is the author of the popular self-help book, "What Color is Your Parachute?" His site is a good introduction for your search, and contains a collection of useful links and handy things to know about how to find a job online.

Monstrous Opportunities

If you're the type that has no qualms about jumping off the deep end, then the perfect place to start your job search is the Monster Board (<http://www.monster.com>). One of the largest job banks online, it features more than 60,000 job postings. You can search by geographic location or by keywords that describe the job you are looking for, such as "waste-

water treatment" or "industrial hygiene." Be sure to post your résumé, as employers also use the job bank to fill positions. If you're looking for an opportunity abroad, international jobs are also posted. More than 4,000 of the world's leading corporations have profiles available, and you can search for temporary housing from the 1.8 million apartments listed.

One interesting section calculates your salary based on the different cost of living expenses in cities across the world. For example, according to the Monster Board's Salary Calculator™, if you earn \$45,000 a year in Denver, Colo., you need \$55,247 a year to maintain the same living standard in Philadelphia, Pa. Likewise, the same salary in Cairo, Egypt, translates into \$64,894 in Okinawa, Japan. Other career resources on the Monster Board include tests on your personality and interviewing skills, and articles on finding a new job.

Still Searching?

Since no online job bank completely represents all the positions available, it's best to conduct searches on different career sites. Job Hunt (<http://www.job-hunt.org>) is a large collection of links to other career-related sites and is particularly relevant to environmental professionals because it provides links to major national laboratories. Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratory and an index of U.S. government laboratories are just a few that are featured. Other career sites include HeadHunter.Net (<http://www.headhunter.net>), CareerSite® (<http://www.careersite.com>), Help Wanted (<http://www.helpwanted.com>), JobWeb (<http://www.jobweb.com>) and NationJob (<http://www.nationjob.com>).

Recent Graduates Looking for Jobs

If you are a recent college graduate and are not one of the fortunate few who have employers beating a path to your door, there are many good sites to help young professionals. The Online Career Center (<http://www.occ.com>) has sections on résumés, career assistance, career fairs and events, cultural diversity and college forums. The National Association of Colleges and Employers (formerly known as the College Placement Council Inc.) (<http://www.jobweb.org/nace>) has more than 1,600 U.S. member universities and more than

1,400 employer organizations.

Students may be familiar with NACE's publication, *Job Choices*, one of the most recommended career guides for college graduates. NACE not only provides research on the hottest markets and average starting salaries for graduates, but also forecasts future trends. Many of the career sites have special sections devoted to helping recent college graduates join the ranks of the em-

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misc.jobs.offered
misc.jobs.offered.entry
misc.jobs.resumes
sci.research.careers
sci.research.postdoc
sci.environment
talk.environment

ployed, and more colleges and universities are providing online resources for their graduates and alumni.

Newsgroups and Discussion Groups

Newsgroups and discussion groups are also valuable to your job search. Although very similar forums, they differ in the way they disseminate information.

A discussion group is a list of people that discusses various topics by posting to a list or "message center." When you subscribe to most electronic discussion groups, your e-mail address is automatically added to the message center and, consequently, every message sent to the list is received by all subscribers on the

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<http://www.ajb.dni.us/index.html>
FRS Federal Jobs Central
<http://www.fedjobs.com>
Federal Government
<http://www.fedworld.gov>
Galaxy Workplace
<http://galaxy.einet.net/galaxy.Community/Workplace.html>

list. When you want to reply to a message, you have the option of only responding to a particular person's e-mail address or sending it to the entire group.

For example, the Environmental Jobs List discussion group is called EN-VJOBS-L. To subscribe to the group you simply send an e-mail message to listserv@cedar.univie.ac.at. In the body of

QUICK REFERENCE LIST

CareerCity
<http://www.careercity.com>
Career Connections
<http://www.career.com>
Career Magazine
<http://www.careermag.com>
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<http://careermosaic.com>
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NationJob
<http://www.nationjob.com>
The Monster Board
<http://www.monster.com>
Online Career Center
<http://www.occ.com>
Yahoo Business and Economy: Employment
http://www.yahoo.com/Business_Economy/Employment

the message you say that you want to subscribe by typing the message: subscribe envjobs-1 firstname lastname (insert your first and lastname).

While discussion groups e-mail messages to subscribers, newsgroups provide a common gathering place for job seekers to network. Much like bulletin boards, they are a forum to exchange and discuss ideas. There are approximately 18,000 newsgroups online and many of them can help you find a job.

Newsgroups are grouped into similar subjects called hierarchies. Most of the hierarchies are abbreviated. Some samples and meanings of the abbreviations are:

- alt—alternative groups;
- comp—computer-related subjects;
- misc—miscellaneous;
- rec—recreational groups;
- sci—science-related subjects; and
- soc—sociable discussions.

ENVIRONMENTAL JOBS

Environmental Careers Inc.
<http://www.environmentalcareers.com>

EnviroIndustry
<http://www.enviroindustry.com/employment/index.html>

Environmental Employment Pages
<http://www.datacor.com/jobfair/environment/home.html>

Environmental Professional Professional's Guide to the Net
<http://www.geopac.com/#7>

EnviroWorld
<http://www.enviroworld.com>

National Registry of Environmental Professionals (NREP) Job Bank
<http://www.nrep.org>

Water Resources
<http://www.uwin.siu.edu/announce>

Some newsgroup names are broken down further to better explain the subject, such as misc.jobs.offered. When you visit a group to read the posted messages (which you can do either through your browser or your newsreader), you will see the subject titles of the messages and the e-mail addresses of the individuals who posted the messages. If you would like to respond, you can either post a reply to the newsgroup or e-mail the person privately.

Once you have found the newsgroups that interest you, you can subscribe to them and, instead of going to them, they can come to you. By subscribing you have the most recent threads sent directly to your newsreader every time you open it. You can subscribe or unsub-

scribe at any time.

Dejavu News (<http://www.dejavu-news.com>) has more than 15,000 news-

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InfoSeek
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Lycos
<http://www.lycos.com>

Yahoo
<http://www.yahoo.com>

groups archived and you can search some messages all the way back to 1979. Not only does it provide the messages, but it also gives you author profiles, which tell you who posted, when and how many times. Newsgroups that are not necessarily about job hunting still help you because they provide a means of networking. Search the newsgroups for topics in your profession, join the discussion and make some professional contacts. You'll find that many of the subjects being discussed are job related.

Some career sites have indexed all the job-related newsgroups by keywords and geographic areas, which cuts down your search time. CareerCity Jobs (<http://www.adamsonline.com>) lists more than 100 newsgroups that advertise job openings. It even breaks the newsgroups into cities and states. Looking for a job in Arizona? Try the newsgroup az.jobs. CareerCity also has corporate recruiting links, which allow you to search for companies whose web pages contain job openings and descriptions.

Don't Wait for Sunday Classifieds

The nice thing about conducting a job search online is the worldwide access you have to newspapers and classified advertisements. Most major daily newspapers are online and provide classified sections with search capabilities. Find the web site for the newspaper in your designated "search" city and browse its classifieds.

CareerPath.com (<http://www.careerpath.com>) allows you to simultaneously search classified sections for many major metropolitan newspapers, including the *Boston Globe*, *Chicago Times*, *Los Angeles Times*, *New York Times* and the *Washington Post*. It certainly beats driving to your local bookstore and paying

several dollars for the Sunday edition newspaper of a city across the country.

Searching While You Sleep

One advantage of using the Internet to find a job is that you don't always have to be online to find the perfect position. There are many career web sites that are interactive and continue looking for you long after you have logged off and gone to bed. One site, Job Center (<http://www.jobcenter.com>), charges \$20 for six months to match your qualifications with job advertisements and e-mail you the results. All you have to do is post your résumé and Job Center does the rest. It even automatically publishes your résumé to your choice of newsgroups.

Industry Associations

Never underestimate the value of professional associations to your job search. Many environmental groups are online and some post job openings, including the Water Environment Federation (<http://www.wef.org>), the American Water Works Association (<http://www.awwa.org>) and the Air and Waste Management Association (AWMA) (<http://www.awma.org>). The National Association of Environmental Professionals (<http://www.enfo.com/NAEP>) and the National Registry of Environmental Professionals (<http://www.nrep.org>) also have web sites and provide valuable discussion forums for networking. No matter what profession in which you seek a job, there are scores of associations that offer advice from experts in the field.

The Hunt Begins

Now you have a better idea of where to go and what to do online to find yourself a great job. All it takes is a little computer savvy and a lot of patience and detective work. There are plenty of good jobs waiting to be found, especially for those professionals who don't mind relocating to other parts of the country or world. And once you have interviewed, landed the job and hired the movers, the Internet can also help you purchase a house, find a day care, join a country club and locate restaurants. But that's a completely different article. Good luck and happy hunting. **EP**

Marion Petty is managing editor and internet services manager for Environmental Protection magazine.



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ACT NOW ON TITLE V

Air emission regulations trigger new reporting and recordkeeping as state program deadline nears.

By Timothy J. Ryan, CIH, CSP

Many smaller plant operators, historically less scrutinized by environmental regulatory agencies, would be surprised to learn that the activities or equipment in their facilities could label them as "major sources" of air pollution under the Clean Air Act (CAA) Amendments of 1990. Even more surprising might be the realization that some chemicals routinely released from their sites for decades are now classified as hazardous, or toxic, air pollutants that need state or federal emission permits. Organizations located in unacceptably high pollution zones or non-attainment areas are especially likely to warrant an examination of their status relative to regulations emerging as a direct result of the CAA. As a result of looming air pollution laws, many plants should begin to anticipate costs associated with inventorying, permitting and controlling their air pollution sources.

Under the CAA changes, vehicle emissions testing and Employee Trip Reduction Programs of the early 90s are no longer the only onerous tasks some facilities must address. And unlike these

or other efforts already underway, compliance with the CAA rules on air emissions could very likely create new permitting costs for many institutions, as

All stationary point sources, all fugitive emissions, all air pollution control equipment, most mobile sources and many work practices should be evaluated for inclusion in an emissions inventory.

well as increased staffing expenses to maintain emission records. Some organizations may ultimately face significant unanticipated capital outlays to install new air cleaning equipment or upgrade inefficient plant devices.

CAA and Title V

With the changes to the Clean Air Act in 1990, the very nature of permitting for air pollution sources was overhauled. Under the new requirements spelled out in Title V (Permits) of the CAA, states must develop a comprehensive operating permit system for sources. Generators familiar with the original Part B permitting process for hazardous waste activities may have an idea of the new CAA process, even though the CAA process is not as straightforward. Every state except Virginia has at least interim approval of their State Implementation Plans (SIPs) to manage Title V permits in their domain. But the Air Permit Report of August 30, 1996, indicated that the vast majority of SIP approvals were published as final actions in the Federal Register only as recently as late 1995 and early 1996.

At the federal level, these clean air compliance laws have been codified by the U.S. Environmental Protection Agency regulations contained primarily in 40 Code of Federal Regulations (CFR) Parts 60, 63 and 70. Most SIPs are based on these regulations, although

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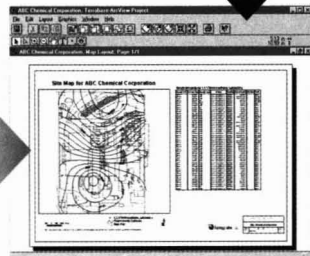
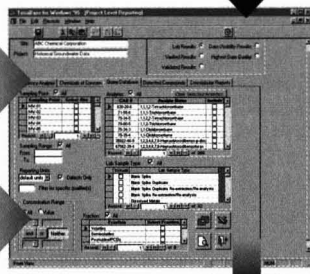
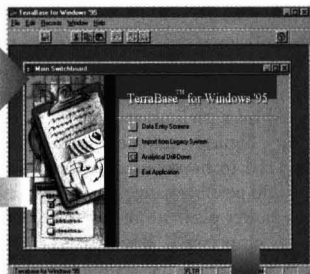
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critical differences can and do exist. Depending on the state, additional permitting requirements may also apply. Because of continuing legal challenges, many permits long required by SIPs are only now advancing as deadlines first enacted years ago approach.

The list of equipment, processes and sources to be evaluated for a Title V permit is, by most industrial measures, counter intuitive and exhaustive. Virtually any source that is not part of a normal office building air handling system may be subject to listing if located within a state's non-attainment areas. Many obvious sources are listed below, but numerous other—and sometimes surprising—sources should also be considered by a preliminary emissions inventory. Typical equipment or processes that need to be investigated for emissions and possibly named in a permit include power plant steam boilers, Freon-based compressors, emergency generators, cooling towers, scrubbers, lithographic/printing operations, laboratory fume hoods, paint booths, welding operations, gasoline tanks, shop ventilation and vapor degreasers.

Some less commonly considered sources may include drycleaners, laundries, hospital chemical sterilizers or disinfectant baths, foam and asphalt roofing operations, photographic laboratories, pathological incinerators, eating establishment canopy hoods, diagnostic pathology laboratories, parking lot asphalt paving operations and hazardous waste handling operations.

All stationary point sources, all fugitive emissions, all air pollution control equipment, most mobile sources and many work practices should be evaluated for inclusion in an emissions inventory. Many sources may ultimately be considered insignificant or "de minimis" and therefore exempt from Title V reporting—depending on the language of the state's own program rules—but all should be included in at least an initial emissions listing.

Liabilities

The civil and criminal liability portions of the CAA should be considered carefully. Civil penalties can be as high as \$5,000 a day per violation. The CAA makes provision for direct legal action by private parties and, perhaps more importantly, enables the EPA to pay bounties to individuals of up to

\$10,000 for information leading to civil or criminal penalties. Finally, like other environmental regulations, the CAA has criminal enforcement provisions for senior management personnel of up to \$250,000 a day per violation and five years in jail. A maximum of two years jail time is permitted for simply failing to file CAA records or maintain CAA reports.

Permitting Issues

The actual permitting requirements for institutions vary by state, location, and activities and processes on the site. For that reason it is impossible within the scope of this article to do more than mention key aspects of the Clean Air Act that should be considered in trying to ascertain if a Title V permit is required. Some of the more important questions to be answered included:

- Does the sum of all the sources of all air pollutants at the site constitute a major source (i.e., in an attainment area, does the operation emit more than 100 tons per year of any criteria air pollutant, or 10 tons per year of any of 188 listed "hazardous" air pollutants)? The very need for a permit may be resolved on this basis alone.

- Is the facility located in a non-attainment area for one or more specific air pollutants (e.g., ozone or carbon monoxide)? Different timelines and control technologies (e.g., maximum achievable control technology versus best available control technology or reasonably available control technology) are in effect for attainment versus non-attainment areas, with lower emission limits requiring permits being applicable in non-attainment areas.

- If in a non-attainment area, what is the non-attainment areas classification: "marginal," "moderate," "serious," "severe" or "extreme." And are changes to the current attainment status pending with the EPA? Depending on the classification, different timelines for compliance exist in addition to different emission limits.

- What governmental entity is responsible for CAA compliance, and what is the status of implementation plans? In some states, responsibility for CAA compliance rests with a county governmental office or specially designated airshed district. Since the original SIPs were to have been submitted for EPA approval in 1993, only now are

permits for some sources beginning to become issues in certain jurisdictions. Some SIPs have elected to defer for the maximum five years any regulation of nonmajor sources.

Problems in reporting abound and involve political, economic and logistical issues. For example, all contiguous locations funded by an organizational "parent" must be included in the parent organization's permit application. Remote sites, adjacent centers, dockside marine operations, prototype technology development centers and others must all be considered individual sites if they are the legal or administrative responsibility of the main organization. If not contiguous, each non-contiguous site may require its own permit if the property is under common control (e.g., a plant-run remote power generation site). On the downside, such sites may require individual emission evaluations. However, sources at these sites may ultimately be exempted from permitting due to their non-contiguous standing relative to larger sources at parent sites.

Recommendations

Regardless of size, if your organization has not yet examined compliance with Title V of the CAA of 1990, it should do so soon. Intuitive reasoning about applicability of the act to a given site can lead to false conclusions. In the worse case, an operation may find itself out of compliance with the permitting requirements of Title V, and therefore subject to both civil and criminal provisions of the Clean Air Act.

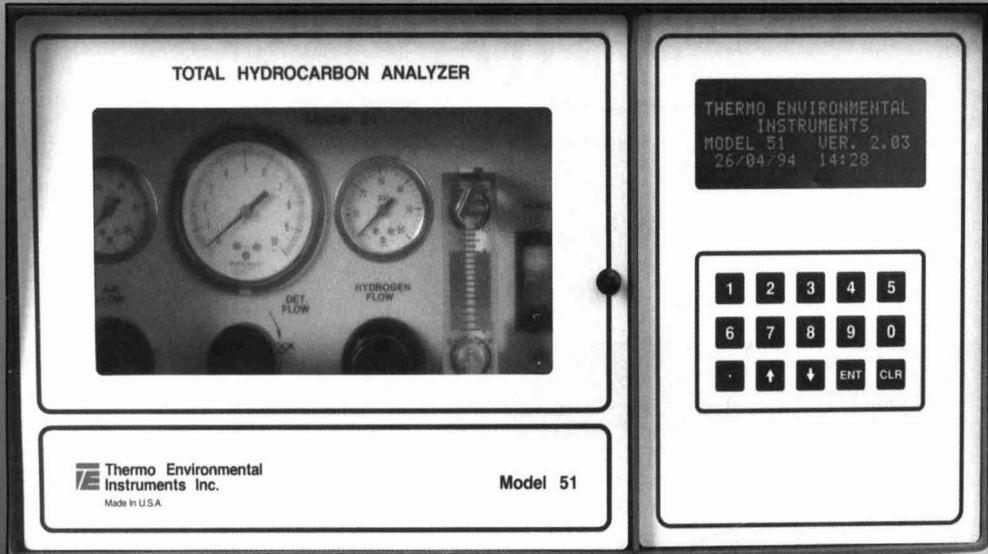
If the issue of Title V compliance has not been conclusively addressed, efforts toward that end should begin soon. Given the considerable confusion about certain aspects of control technologies, such as what constitutes a process modification as opposed to what changes may legitimately be accomplished under existing approvals, it may be advantageous to accelerate certain plant upgrades ahead of schedule to obviate or simplify permitting requirements. **EP**

Timothy J. Ryan, CIH, CSP, is director/risk manager of the Environmental and Physical Safety Department at the University of Houston, in Houston, Texas.

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SHIPPER'S GUIDE TO SAFE HAZMAT TRANSPORTATION

Following guidelines and complying with regulations are imperative in safely transporting hazardous materials.

By Prokopis A. Christou, PE



Highly publicized transportation incidents involving explosions, injuries or loss of lives have heightened public awareness of the dangers in hazardous material transportation. Although the public tends to view the transport of hazardous material in worst case scenarios, in actuality, the vast majority of hazardous materials shipments arrive at their destinations safely. The shipper, as the initiator of a shipment, plays an important role in the process.

The shipper is legally responsible for identifying the hazards of the materials to be shipped, selecting the right packaging, preparing the shipment so it arrives safely, and providing hazard communication and emergency response information to accompany the shipment that provides warnings and response information. The legal responsibilities are described in regulations implemented by the U.S. Department of Transportation (DOT) and its modal agencies. Shippers must ensure that their actions not only comply with regulations but also protect the company's interests and minimize liabilities from transportation risks.

How Regulations Apply To Your Company

The hazardous materials transportation regulations identify materials that the DOT considers hazardous because they pose an unreasonable risk to health, safety, property or the environment when transported in commerce. The DOT divides the materials into nine main hazard classes that include explosives, gases, flammable liquids, flammable/dangerous solids, oxidizers, poisonous/infectious materials, radioactive, corrosive and miscellaneous materials.

Before a shipper can assess applicability and impact of the regulations he or she must know what hazardous materials are shipped, which ones are received

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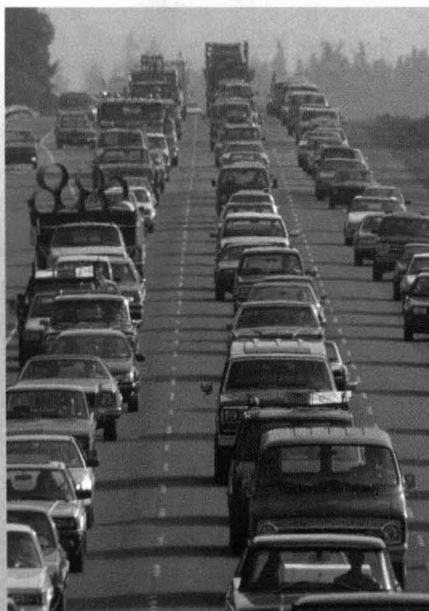
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Shipper's Guide to HazMat Transportation

and unloaded by employees, and which employees are involved in activities affecting hazardous material transportation. Once this information is known the shipper can verify the specific requirements applicable to the shipping and receiving of the materials and identify the employees that need mandatory training.

The best way to assess applicability and verify the requirements is a team approach, taking advantage of the expertise and responsibilities of department members involved in hazardous transportation. Traditionally, shipments for the disposal of hazardous waste, regulated by both the U.S. Environmental Protection Agency and the DOT, are managed by

Shippers must ensure that their actions not only comply with regulations but also protect the company's interests and minimize liabilities from transportation risks.

the environmental department. The shipment of bulk materials are handled by the shipping department. Materials shipped or received through a central warehouse are the responsibility of the inventory control department. The quality assurance department or laboratory may be responsible for shipping product samples, and other departments may be involved in loading or unloading. Emergency response information for materials is usually maintained in material safety data sheets administered by the safety department.

The fragmentation of responsibilities relating to material transportation can lead to discrepancies and duplication of resources, which can be eliminated through an integrated approach by a multi-disciplinary team. The team should verify and consolidate shipping requirements and transportation information for hazardous materials handled by the facility. Major tasks to be completed will be the development of lists

summarizing shipping information for hazardous materials shipped, hazardous materials received and unloaded by employees, and identify employees that need mandatory training. This information must be known to ship, load, unload and receive hazardous materials in compliance with the regulations. Exhibit 1 is an example of the type of information assembled for hazardous materials shipped. Once the information is consolidated, it should be shared with affected departments for use and reference in performing their duties relating to transportation. It can also be used to cross-references with other databases.

The Action Plan

With shipping requirements and information available in a concise form, it is easy to compare with current practices to identify any gaps and opportunities for improvement. The team can also evaluate whether existing systems can ensure compliance with regulations, and can

Exhibit 1. Example of information for hazardous materials shipped

Material Name: Caustic Soda, 50 percent solution

CAS #: 1310-73-2

AAR HM STCC: 4935652

Transportation mode: highway

Quantity per package: 3500 gallons

Bulk/non-bulk? Bulk

DOT authorized packaging: Cargo tank MC 304, 307, 310, 311, 312, 330, 331, DOT 407, 412

DOT shipping description: RQ, Sodium Hydroxide Solution, 8, UN1824, PG II, ERG# 154

DOT markings: Orange panel with UN1824, if not on placards

DOT labels: Not applicable for bulk

DOT placards: Corrosive with Hazard Class number

Emergency response information available: MSDS, ERG

24 hour emergency tel. & contact: CHEMTREC 1-800-424-9300; plant telephone number

Additional information: RQ=1000 pounds Sodium Hydroxide 100 percent

* RQ: Reportable Quantity requiring reporting of spills to the National Response Center
MSDS: Material Safety Data Sheet

STCC: Commodity code assigned by the Association of American Railroads

ERG: Emergency Response Guide of the DOT Emergency Response Guidebook

Exhibit 2. Table of contents of a sample procedures manual

- 1 Introduction
- 2 Definitions
- 3 General Requirements
- 4 Registration
- 5 Training
- 6 Advance Classification & Package Selection
- 7 Offering Hazardous Materials for Transportation
- 8 Emergency Response Information
- 9 Preparing Hazardous Materials for Transportation

develop systems to close the gaps and improve existing systems.

Implementing a systems approach is consistent with recent trends for performance standards and management systems such as the international standards for quality, ISO 9000 and the environmental management systems, ISO 14000. The systems should clearly delineate responsibilities for people involved in the transportation of hazardous materials, rely on qualified individuals, provide employee training, and require hazards classification, package selection and determination of shipping requirements for new materials before they are handled at the facility.

Good management systems include facility procedures that define responsibilities and provide instructions. Exhibit 2 is a table of contents of a sample procedures manual. The procedures should be kept current with regulations and be supplemented by training and audits to ensure a continuous improvement cycle.

Leaving hazardous material transportation to chance is a recipe for disaster that can have serious consequences. Companies shipping hazardous materials can minimize risks by being prepared. Identifying impacts of the hazardous materials regulations and establishing management systems for safe transportation provides for compliance with regulations and protects the company. **EP**

Prokopis A. Christou, PE, is environmental engineer/project manager at Formosa Plastics Corp., U.S.A., in Livingston, N.J., and responsible for environmental and transportation safety issues.

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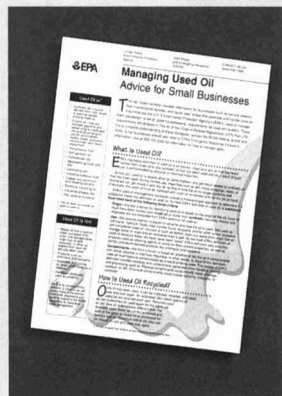
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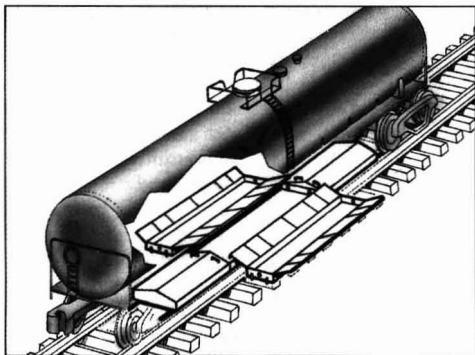
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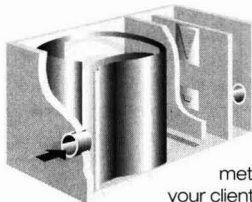
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The compact, highly efficient Vortechs System. Specify it for stormwater permit compliance...today and beyond.

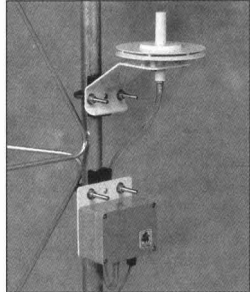
Vortechs, Inc.

Engineered Products for Stormwater Treatment
 41 Evergreen Drive • Portland, Maine 04103
 Ph 207-878-3662 • Fax 207-878-8507 • Online www.vortechs.com

Circle 126 on card.

Electronic Barometer

The Young Model 61201 Barometric Pressure Sensor



analog output electronic barometer performs over a broad temperature range for meteorological and utility applications where continuous power is available. Its companion, the Model 61002 Gill Pressure Port, minimizes errors due to wind. R.M. Young Co.

Circle 160 on card.

Filter Press

JWI manufactures a wide range of sizes of recessed

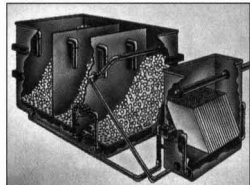


chamber filter presses. Manual and fully automatic options available to meet capacity requirements. Gasketed plates provide drip-free operation. JWI.

Circle 161 on card.

Biotreatment System

The BioSorb system treats and reclaims sewage and bio-



degradable industrial wastewaters. Designed for housing developments, hotels, resorts,

work camps, schools, airports, mining and oil drilling sites, food production plants, livestock facilities and marinas. RGF Environmental Systems Inc.

Circle 162 on card.

Tank Alarm

The Switch Pak™ offers a solution for high- or low-level

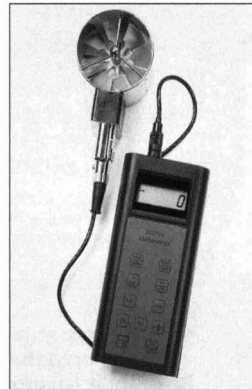


switching through the top wall of tanks. Includes a compact relay pump and valve controller while the flashing Strobe Alert™ indicates process alarm conditions. Applications include high-level spill prevention or low-level pump protection. Flowline.

Circle 163 on card.

Digital Anemometers

Omega's HHF750 series digital anemometers measure



air velocity, calculated air volume flow, temperature and relative humidity. Special features include the ability to switch between English and metric units; average, minimum and

maximum reading; and a display hold button. Omega.

Circle 164 on card.

Hazard Communication

Provide quick access to critical health and safety data related to chemicals in the workplace with Shell's Web-based hazard communication system. Includes an authoring module for creating MSDSs, labels and other documents in any language and format compliant with domestic and foreign regulations. Shell Oil Co.

Circle 165 on card.

Filter Control Valve

The Autotrol Magnum Cv™ commercial and industrial fil-



ter control valve is a top-mount package with 2-inch flow rates. Accommodates 90 gallons per minute at 25 psi pressure drop or 70 gallons per minute at 15 psi pressure drop. Optional electronic controls, impulse controls and more. OSMONICS Autotrol.

Circle 166 on card.

Thermoplastic Solutions

Fluid-Lok™ Polypropylene Dual Containment Piping



System with a prefab Fluid-Lok Trench Drain System provides chemical resistance for manufacturing situations. The thermoplastic system approach for custom-designed pipe and trench drain sections is ideal for complicated systems. Fluid Controls Inc.

Circle 167 on card.

Chromatography Data System

The Turbochrom™ Client/Server Chromatography Data

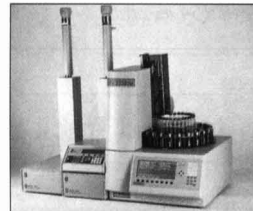


System provides network data acquisition from any liquid or gas chromatograph. Based on the Windows NT® operating system, it allows multiple users to collect, view and process real-time data, set up and control instruments. Perkin-Elmer Corp.

Circle 168 on card.

Dual Mode Extractor

The Isco-Suprex SFX 3560DM Dual Mode Extrac-



tor provides food, polymer and environmental chemists with two extraction techniques in one instrument. Extracts and collects up to 24 samples using bar-coded 10 ml sample cartridges unattended. Isco Inc.

Circle 169 on card.

Pocket Monitor

The 400 single sensor detector is ideal for individuals



requiring temporary monitoring protection when working in areas where gas exposure is a concern. The 450 has a high-contrast LCD display for situations needing a direct

readout in parts per million for inspection or evaluation purposes. AIM.

Circle 170 on card.

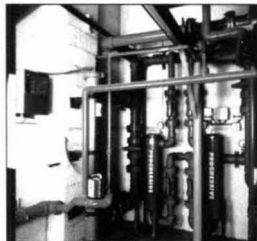
Pneumatic Pump

The MVP IV is an air-lift, controllerless pneumatic pump to transfer fluids to the surface of 4-inch and larger wells. Available in top- or bottom-loading configurations for pumping total fluids or leachate. An internal float with a mechanically operated valve system allows it to cycle automatically. Boart Long-year Co.

Circle 171 on card.

Chem-Free Water Treatment

Ozone controls bacterial and pre-existing electricity



and filtration eliminates scale and solids for a complete, chemical-free, cost-saving water treatment. Systems are self-monitoring and features a solid state power supply, built-in alarm and 24-hour positive performance indicator. Progressive Equipment Corp.

Circle 172 on card.

Datalogger

Solinst Levelogger™ is a 7/8-inch diameter datalogger and



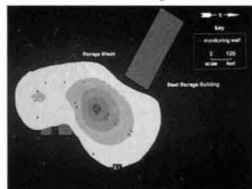
pressure transducer in a self-contained probe for automatically recording water levels in wells. Infrared data transfer eliminates electrical cable and

avoids electrical interference. Stores 16,000 measurements per session. Solinst Canada Ltd.

Circle 173 on card.

Metals Cleanup

Geochemical fixation, a new metals cleanup technolo-



gy, minimizes the threat posed by chromium and other metals in soil and groundwater. It mixes chemical reagents with a smaller volume of pumped groundwater and reinjects the treated water around the perimeter of a contained plume. Fluor Daniel GTI.

Circle 174 on card.

Fume Hood

The Uniflow Air By-Pass Fume Hood directs and main-



tains smooth, uniform air flow into the fume chamber and across the work surface. Available 48-inches to 96-inches wide. By-pass openings automatically redistribute air around the sash to minimize fluctuation in face velocity as the sash is raised or lowered. HEMCO Corp.

Circle 175 on card.

In-Stack Sampling

The CASE-PM2.5 CY-CLADE™ In-Stack Cascade



Cyclone is a two-stage cyclone sampler that attaches to EPA Method 5 or other stack sampling. Separates particulates at 10 and 2.5 microns. Other particle size distribution cut-points available. Graseby Anderson.

Circle 176 on card.

Liquid Air Breathing Apparatus

Scott Aviation will develop and manufacture a cryogenic,



or liquid air source, breathing apparatus for use in contaminated and high-heat atmospheres for up to two hours. Ideal for applications such as hazmat handling, fire service and hazardous cleanup. Designed for light weight and low profile. Scott Health & Safety.

Circle 177 on card.

Drum Crusher

CTI In-Drum Compaction System crushes unusable 55-



gallon drums with the addition of a conversion package to serve as compactor and drum crusher. Eliminates unusable drums by crushing them down to six inches. Compaction force ranges from 40,000 to 85,000 pounds. Haz-Stor/CTI.

Circle 178 on card.

Water Monitor

The Turner Designs TD-4100 XD is a non-fouling

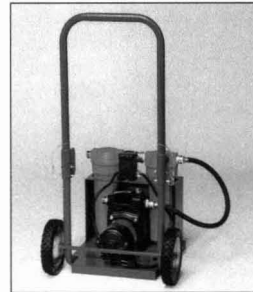


continuous on-line oil-in-water monitor. Designed for offshore oil production, refining and the petrochemical industry. Continuously verifies the effectiveness of oil-in-water treatment systems and detects upsets and unexpected discharges. Turner Designs.

Circle 179 on card.

Pump and Filtration

The Dispos-A-Con® High Volume 1/2 HP Two Stage



Pump and Filtration System is ideal for the asbestos and lead abatement industry. Removes water from decontamination showers or gang showers in a

new products

decontamination trailer. Includes utility in-line pump with automatic cutoff. A.R. Manufacturing Inc.

Circle 180 on card.

Safety Eyewear

The User Friendly Optics (UFO) Series offers safety,



style and comfort to promote voluntary compliance in the workplace while meeting ANSI Z87.1 standards. Models include frameless, wrap-around lenses, custom comfort settings and lightweight frames. H.L. Bouton Co.

Circle 181 on card.

Compliance Software

PlantWare® Audit is a database system that can be used for Title V preparation and compliance assessments. View pertinent regulations, inventory equipment, establish emission units, view compliance test data and manage compliance assessments. Enviro-Metrics Software Inc.

Circle 182 on card.

Pocket Turbidimeter

The 2.5-inch-by-6-inch Pocket Turbidimeter™ Analysis



System measures over the range of 0.1 to 400 NTU/FNU. Features an infrared light-emitting diode

source with a detector mounted at 90 degrees from the incident beam. Ideal for fast, on-site spot checks. Calibration takes only minutes. Hach Co.

Circle 183 on card.

Leak Detection

The LLD-300 line of leak detection systems include

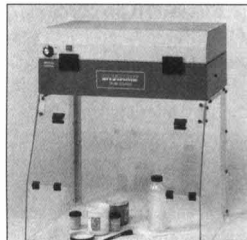


a stand-alone line-leak-only console that connects to wireless pressurized line leak detection (WPLLD) sensors. Data is transmitted over existing pump wires to communicate with the system quickly without installing new wiring. Veeder-Root.

Circle 184 on card.

Fume Elimination

The MYSTAIRE FE-2620 Chemical Work Station fume



Enclosure eliminates hazardous fumes and vapors generated in a variety of applications. For use in slide staining and cover slipping; drug and chemical analysis; fingerprinting; pipetting; and graphic arts. Misonix Inc.

Circle 185 on card.

On-Line Property Info

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VALUABLE
RESOURCE.

A black and white advertisement for Enviro-Office. The top half features the text 'STOP WASTING YOUR MOST VALUABLE RESOURCE.' in a bold, sans-serif font. Below the text is a photograph of a hand holding a lit match over a \$100 bill that is being burned. The bottom half of the advertisement features the 'enviro-office' logo, which consists of the word 'enviro' in a smaller font above 'office' in a larger, bold font, with three overlapping circles behind the text. The background of the entire advertisement is a dark, textured surface.

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Circle 186 on card.

GPS System

The +Advantage™ Nav-Trac™ uses Global Positioning

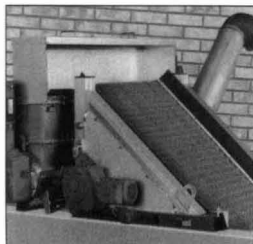


Satellite, differential GPS and ultrasonic time-of-flight technology to determine the surveyor's location automatically each second, to the user's specified accuracy, down to 15 centimeters. Compatible with almost any sensor. Chemrad Tennessee Corp.

Circle 187 on card.

Screens

The Hydro Grid™ fine screen removes finer material

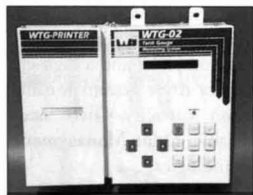


with the filtering effect of the captured screenings. Made of stainless steel and requires low headroom. For more efficiency, combine with the Clean Squeeze™ washer compactor, which washes organics from the screens and dewater. Schreiber Corp.

Circle 188 on card.

Monitoring System

Inventory volumes of ASTs and USTs accurately with the

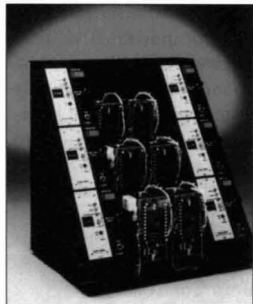


WTG-02 Tank Gauging System. Monitors up to two tanks and alerts users when tanks reach low, high or overflow conditions. Separate float detects accumulation of water in the bottom of tanks. Leak detection continuously monitors tanks' integrity. Warrick Controls.

Circle 189 on card.

Calibration System

The Span Lab™ TO-14 Calibration Bench for VOC



analysis generates a flowing stream of calibration mixture for direct feed into analysis system or captured in SUMMA canisters. It contains a group of 30 individually controlled permeation tube ovens with eight tubes in each oven. KIN-TEK Laboratories Inc.

Circle 190 on card.

Water Jetting

Prepare surfaces, including paint and rust removal, with a



flexible, ultra-high pressure machine. The Ultra-Blast 36™ has a four-speed transmission

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Circle 128 on card.

new products

that lets operators change from 36,000 psi to 25,000 psi at various flow rates. Conversion kits produce lower pressures at higher flows. **Butterworth Jetting Systems Inc.**

Circle 191 on card.

Chlorine Kit

C-Kit for containing chlorine leaks on tank cars and

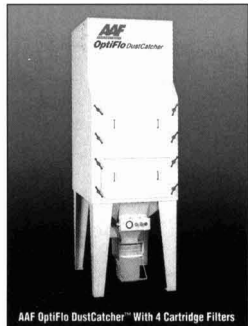


trucks valve capping devices now require fewer components, are easier to apply and are much lighter. The single-piece, lightweight yoke assembly is stored fully assembled. Approved by the Chlorine Institute. **Indian Springs Specialty Products Inc.**

Circle 192 on card.

Dust Control

Control single-source dust and fume with the OptiFlo

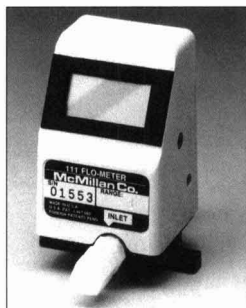


DustCatcher. Picks up sub-micron particulate to recirculate clean plant air. Available in three sizes and contains an enclosed fan with built-in silencer, self-cleaning cartridge filters, wired control panel and disposal container. **AAF International.**

Circle 193 on card.

Digital Flowmeter

The "S" Series flowmeters, available in 14 ranges, mea-

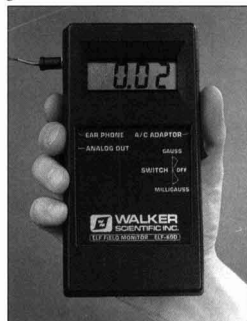


sure low-liquid or gas flow rates. Measurements are displayed on a 3 1/2-digit LCD digital display with a 0-5 VDC output for recorded data. AC-DC adapter plug available. **McMillan Co.**

Circle 194 on card.

Radiation Monitor

Power companies, plant engineers and scientists measur-

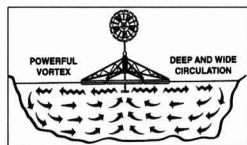


ring low-level electromagnetic field radiation now have the hand-held ELF-60D Field Monitor. It reads as low as 0.1 milligauss and instantly displays readings on a 3 1/2-digit LCD. Audio pulse output echoes field intensity. **Walker Scientific Inc.**

Circle 195 on card.

Wind-Powered Aerator

The Eco-Eddy wind-powered aerator/circulator breaks



down solids, increases dissolved oxygen, stimulates biological activities and reduces

odors. Made with heavy-duty components, a high-performance impeller and a high-efficiency drive system for all-season capacity. **Odor Management Technologies.**

Circle 196 on card.

Evaporation System

The RapidVap® Evaporation System processes multiple

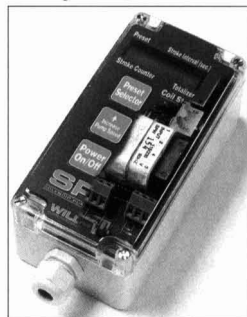


biological or analytical samples with individual volumes up to 450 ml. Microprocessor-controlled, mechanically created vortex action forces liquid samples outward against the tube walls increasing surface area for faster evaporation. **Labconco Corp.**

Circle 197 on card.

Pump Controller

Expand the benefits of solenoid-operated, double dia-



phragm pumps with the Solenoid Pump Controller I (SPC I). The microprocessor-based controller communicates with the pumps to automate the liquid process. Customized applications include liquid level, proximity and temperature. **Wilden Pump & Engineering Co.**

Circle 198 on card.

UPW Custom Products

Custom user-specific Polyvinylidene Fluoride (PVDF)



required for the ultrapure water (UPW) market are available from **George Fischer's Class 10,000 clean room**. Assembly, final cleaning and packaging of custom components take place in a particle-controlled environment. **George Fischer Inc.**

Circle 199 on card.

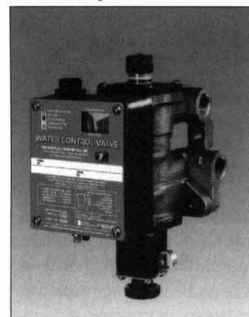
Scrap Shredder

The Model ST-500H is a hydraulic shredder designed to reduce telephone switching panels, telecommunications racks with wiring, mainframe computers and general electronics scrap. Once shredded, all materials can be separated and recovered. **Shred-Tech.**

Circle 200 on card.

Water Valve

The Water Control Valve (WCV) improves robotic weld



quality by preventing leaks and defective welds. Water flow to a displaced or broken resistance welding cap is shut off and an alarm notifies the operator. Operation can be anywhere with open or closed systems. **Universal Flow Monitors Inc.**

Circle 201 on card.

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product literature



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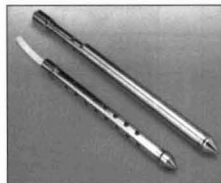
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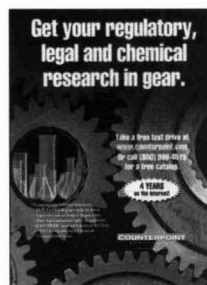
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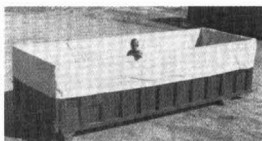
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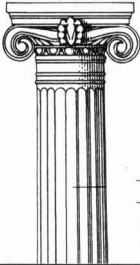
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| 173 | Solinst Canada Ltd. | 41 |
| 179 | Turner Designs | 41 |
| 201 | Universal Flow Monitors Inc. | 44 |
| 184 | Veeder-Root | 42 |
| 195 | Walker Scientific Inc. | 44 |
| 189 | Warrick Controls | 43 |
| 198 | Wilden Pump & Engineering Co. | 44 |
| Product Literature | | |
| 133 | Counterpoint Publishing | 45 |
| 130 | D&L Associates Inc. | 45 |
| 131 | EET Inc. | 45 |
| 132 | Solinst Canada Ltd. | 45 |
| Classifieds | | |
| 136 | Automation Products Inc. | 46 |
| 137 | Youngstown Barrel and Drum Co. | 46 |

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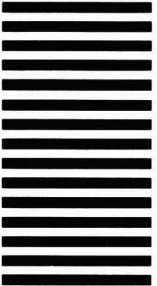
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FREE PRODUCT INFORMATION FOR ENVIRONMENTAL PROTECTION

August 1997

Table with 20 columns of numbers (100-116) and 20 rows of numbers (100-116) representing a grid of product information.

Card Expires October 1997

Interested because of: 95 New Construction 96 Adding Capacity 97 Plant Upgrade 98 Maintenance 99 1 for 1 Replacement

FREE SUBSCRIPTION INFORMATION 08/97. Includes fields for Yes/No, Signature, Name, Title, Company, Address, City, State, Zip, Phone, and E-Mail.

FOR FASTER SERVICE USE PEEL OFF LABEL

A. Function which best describes your activity in Pollution Control. B. Type of Business. C. Approximate number of employees at this address. D. In your job function do you recommend, specify or purchase? E. What types of Pollution Control are you responsible for? F. Which of the following publications do you receive personally addressed to you?

- G. Which of the following Pumps, Piping and Valves product(s) services do you plan to purchase in the next 12 months? (Select all that apply) 800 Centrifugal Pumps, 801 Diaphragm Pumps, 802 Sewer Pipes, 803 Water Pipes, 804 Airlock Valves, 805 Plug Valves, 806 Pinch Valves, 807 Check Valves, 808 Ball Valves, 809 Butterfly Valves, 810 Gate Valves, 811 Flow Meters, 812 In-line Filters, 813 Chemical Metering Pumps, 814 Drum Pumps, 815 Sludge Pumps, 816 Progressing Cavity Pumps, 817 Grinder Pumps, 818 Plastic Pumps, 819 Sewage Pumps

- 820 Submersible Pumps, 821 Water Pumps, 822 Double Secondary Contained Pipes, 823 Ductile Iron Pipes, 824 Fiberglass Pipes, 825 PVC Pipes, 826 Stainless Steel Pipes, 827 Plastic Pipes, 828 Pipe Locators, 829 Steel Pipes

- H. What is your reason for purchasing the selected products/services? (Select one) 830 New Construction, 831 Plant Upgrade, 832 Replacement/Maintenance. I. What is your projected budget for the selected products/services? (Select one) 833 Over \$200,000, 834 \$100,001-\$200,000, 835 \$50,001-\$100,000

- J. How immediate is your need for the selected products/services? (Select one) 836 \$10,001-\$50,000, 837 \$5,000-\$10,000, 838 Under \$5,000. J. How immediate is your need for the selected products/services? (Select one) 839 0-3 months, 840 4-6 months, 841 7-9 months, 842 10-12 months, 843 Over 12 months

FREE PRODUCT INFORMATION FOR ENVIRONMENTAL PROTECTION

August 1997

Card Expires October 1997

| | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 100 | 117 | 134 | 151 | 168 | 185 | 202 | 219 | 236 | 253 | 270 | 287 | 304 | 321 | 338 | 355 | 372 | 389 |
| 101 | 118 | 135 | 152 | 169 | 186 | 203 | 220 | 237 | 254 | 271 | 288 | 305 | 322 | 339 | 356 | 373 | 390 |
| 102 | 119 | 136 | 153 | 170 | 187 | 204 | 221 | 238 | 255 | 272 | 289 | 306 | 323 | 340 | 357 | 374 | 391 |
| 103 | 120 | 137 | 154 | 171 | 188 | 205 | 222 | 239 | 256 | 273 | 290 | 307 | 324 | 341 | 358 | 375 | 392 |
| 104 | 121 | 138 | 155 | 172 | 189 | 206 | 223 | 240 | 257 | 274 | 291 | 308 | 325 | 342 | 359 | 376 | 393 |
| 105 | 122 | 139 | 156 | 173 | 190 | 207 | 224 | 241 | 258 | 275 | 292 | 309 | 326 | 343 | 360 | 377 | 394 |
| 106 | 123 | 140 | 157 | 174 | 191 | 208 | 225 | 242 | 259 | 276 | 293 | 310 | 327 | 344 | 361 | 378 | 395 |
| 107 | 124 | 141 | 158 | 175 | 192 | 209 | 226 | 243 | 260 | 277 | 294 | 311 | 328 | 345 | 362 | 379 | 396 |
| 108 | 125 | 142 | 159 | 176 | 193 | 210 | 227 | 244 | 261 | 278 | 295 | 312 | 329 | 346 | 363 | 380 | 397 |
| 109 | 126 | 143 | 160 | 177 | 194 | 211 | 228 | 245 | 262 | 279 | 296 | 313 | 330 | 347 | 364 | 381 | 398 |
| 110 | 127 | 144 | 161 | 178 | 195 | 212 | 229 | 246 | 263 | 280 | 297 | 314 | 331 | 348 | 365 | 382 | 399 |
| 111 | 128 | 145 | 162 | 179 | 196 | 213 | 230 | 247 | 264 | 281 | 298 | 315 | 332 | 349 | 366 | 383 | 400 |
| 112 | 129 | 146 | 163 | 180 | 197 | 214 | 231 | 248 | 265 | 282 | 299 | 316 | 333 | 350 | 367 | 384 | 401 |
| 113 | 130 | 147 | 164 | 181 | 198 | 215 | 232 | 249 | 266 | 283 | 300 | 317 | 334 | 351 | 368 | 385 | 402 |
| 114 | 131 | 148 | 165 | 182 | 199 | 216 | 233 | 250 | 267 | 284 | 301 | 318 | 335 | 352 | 369 | 386 | 403 |
| 115 | 132 | 149 | 166 | 183 | 200 | 217 | 234 | 251 | 268 | 285 | 302 | 319 | 336 | 353 | 370 | 387 | 404 |
| 116 | 133 | 150 | 167 | 184 | 201 | 218 | 235 | 252 | 269 | 286 | 303 | 320 | 337 | 354 | 371 | 388 | 405 |

Interested because of: 95 New Construction 96 Adding Capacity 97 Plant Upgrade 98 Maintenance 99 1 for 1 Replacement

FREE SUBSCRIPTION INFORMATION

08/97

- Yes! Send/Continue to send *Environmental Protection* free of charge.
 No, I'm not interested at this time.

Signature (Required) _____ Date _____

Name _____

Title _____

Company _____

Address _____

City _____ State _____ Zip _____

Zip+4 _____ Phone _____

Fax _____ E-Mail _____

**FOR FASTER SERVICE
USE PEEL OFF LABEL**

- A. Function which best describes your activity in Pollution Control (check only one):
 A Corporate responsibility for Pollution Control
 B Manage all Pollution Control Operations at this location
 C Supervise sub-group in Pollution Control Operations
 D Provide professional consulting service on Pollution Control
 E Provide staff environmental service on Pollution Control
 Z Other _____
- B. Type of Business (check only one):
 A Manufacturing. If manufacturing, please check the appropriate SIC (check only one):
 J (20) Food J (31) Leather
 J (21) Tobacco J (32) Stone/Clay/Glass
 J (22) Textile J (33) Primary Metal
 J (23) Apparel J (34) Fab. Metal
 J (24) Lumber & Wood J (35) Mach., except Elect.
 J (25) Furniture J (36) Elect. & Electron Mach
 J (26) Paper J (37) Trans. Equip
 J (27) Print/Publish J (38) Instr./mass./analyze
 J (28) Chemicals J (39) Instr./controlling
 J (29) Petrol. & Coal J (39) Miscellaneous Mfg
 J (30) Rubber/Plastic
- Mining L Consulting
 Agriculture M Insurance
 Engineering & Contracting E Utilities, public, private & cooperative
 Govt. including municipal or district sanitary water or wastewater treatment sys. or plants F Govt. including municipal or district sanitary water or wastewater treatment sys. or plants
- Type of Govt:
 G City H County
 I State J Federal
- K Transportation
 N Labs O Training
 Z Misc. Services P Real Estate
- C. Approximate number of employees at this address (check only one):
 A 1-19 D 100-249 G 1000-1499
 B 20-49 E 250-499 H 1500-2499
 C 50-99 F 500-999 I 2500 and up
- D. In your job function do you recommend, specify or purchase? (check all that apply)
 A Pollution Control Equipment
 B Instrumentation
 C Chemicals
 D Parts & equipment for maintenance operation and control
- E Services/Consulting
 F None of the above
- G. What types of Pollution Control are you responsible for? (check all that apply)
 A Air F Toxic & hazardous material
 B Water G Energy control
 D Solid Waste energy conservation
 Disposal H None of the above
 E Industrial hygiene
- F. Which of the following publications do you receive personally addressed to you? (check all that apply)
 A Pollution Engineering
 B Environmental Today
 C Environmental Solutions
 D Pollution Equipment News
 E The National Environmental Journal
 F Water Environment & Technology
 G None of the above

G. Which of the following Pumps, Piping and Valves product(s) /services do you plan to purchase in the next 12 months?(Select all that apply)

- | | |
|--|---|
| 800 <input type="checkbox"/> Centrifugal Pumps | 810 <input type="checkbox"/> Gate Valves |
| 801 <input type="checkbox"/> Diaphragm Pumps | 811 <input type="checkbox"/> Flow Meters |
| 802 <input type="checkbox"/> Sewer Pipes | 812 <input type="checkbox"/> In-line Filters |
| 803 <input type="checkbox"/> Water Pipes | 813 <input type="checkbox"/> Chemical Metering Pumps |
| 804 <input type="checkbox"/> Airlock Valves | 814 <input type="checkbox"/> Drum Pumps |
| 805 <input type="checkbox"/> Plug Valves | 815 <input type="checkbox"/> Sludge Pumps |
| 806 <input type="checkbox"/> Pinch Valves | 816 <input type="checkbox"/> Progressing Cavity Pumps |
| 807 <input type="checkbox"/> Check Valves | 817 <input type="checkbox"/> Grinder Pumps |
| 808 <input type="checkbox"/> Ball Valves | 818 <input type="checkbox"/> Plastic Pumps |
| 809 <input type="checkbox"/> Butterfly Valves | 819 <input type="checkbox"/> Sewage Pumps |

- 820 Submersible Pumps
 821 Water Pumps
 822 Double Secondary Contained Pipes
 823 Ductile Iron Pipes
 824 Fiberglass Pipes
 825 PVC Pipes
 826 Stainless Steel Pipes
 827 Plastic Pipes
 828 Pipe Locators
 829 Steel Pipes

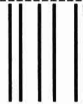
- H. What is your reason for purchasing the selected products/services? (Select one)
 830 New Construction
 831 Plant Upgrade
 832 Replacement/Maintenance
- I. What is your projected budget for the selected products/services? (Select one)
 833 Over \$200,000
 834 \$100,001-\$200,000
 835 \$50,001-\$100,000

- 836 \$10,001-\$50,000
 837 \$5,000-\$10,000
 838 Under \$5,000

- J. How immediate is your need for the selected products/services? (Select one)
 839 0-3 months
 840 4-6 months
 841 7-9 months
 842 10-12 months
 843 over 12 months

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