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Executive Yuan Holds Summit on Industrial Waste Management

Problems with industrial waste treatment are beginning to turn heads in high places. The Executive Yuan recently called together industry members, academics, and environmental groups to address the issue. At the meeting, Premier Tang Fei asked relevant ministries and departments to work together to promote industrial waste treatment. A dual approach consisting of controls and incentives will be used in hopes of reaching a solution.

Recently in Taiwan, a series of major environmental incidents have begun to turn heads in high places. On August 1 Executive Yuan Premier Tang Fei (唐飛) led a meeting aimed at finding a solution for Taiwan's industrial waste problems. The meeting included Minister of Justice, Chen Ding-nan (陳定南), Minister of Economic Affairs, Lin Hsin-yi (林信義), EPA Administrator, Edgar Lin, and other executive branch leaders, as well as members of industry, waste service providers, environmental groups, experts and academics. The cross-ministerial nature of the meeting made it one of the few true government summits addressing issues of an environmental nature.

At the summit, Premier Tang pointed out that the Kaoping incident shows Taiwanese are becoming environmentally aware. While environment has not superceded economic development in importance, at least the two can be said to be equal. The Premier further noted that the Kaoping incident reveals the inadequacy of Taiwan's capacity for industrial waste treatment. He stated that increased auditing and inspections of industrial waste are important to treat symptoms of the problem, but that providing incentives to encourage establishment of treatment facilities is the way to reach a real cure. And, such a cure can only come through cooperation by the EPA, Ministry of Economic Affairs (MoEA), Ministry of Justice, and other executive agencies.

EPA Administrator, Edgar Lin, stated that industrial waste was entirely to blame for the recent Kaoping dumping incident. Although amendments to the *Waste Disposal Act* in 1974 bestowed the EPA some powers to deal with industrial waste, most powers remain with local governments. Even at present, there is too much the EPA does not know about the waste generated by industrial organizations. However, in the future it is hoped that the EPA can accurately know the nature and quantities of at least 95% of industrial waste. In addition, Lin urged the government to encourage formation of joint local "self defense" organizations, such as the re-

cently proposed Kaoping "river defense team." (see article on page 7)

During discussions, Edgar Lin pointed out that reporting on the nature and quantity of waste by industrial organizations and waste service providers is not accurate enough to be highly useful. And, that the lack of accurate information confounds government investigations of at-source waste management. He pointed out that enterprises currently attach little importance to waste treatment, but in the future must bear greater social responsibility. This means that enterprises must track disposal of wastes contracted to legal waste service providers or else find acceptable self-treatment or joint-treatment methods.

In terms of at-source waste management policies, Administrator Lin pointed out that the EPA will immediately begin reviewing information reported by state enterprises, industrial parks, and waste service providers over the past half year. This will be followed by review of waste reporting by science parks, educational agencies, the 1,000 largest industrial enterprises and highly polluting industries, such as leather and chemicals, etc. Information reported by waste generators and waster service providers will be cross referenced to verify the accuracy of reporting records.

Minister of Justice, Chen Ding-nan, entered the debate from an enforcement perspective. He pointed out that Taiwan has clear laws regarding hazardous wastes, but that for many years the laws have not been faithfully implemented, resulting in the current waste treatment situation. He noted that from an investigators standpoint, environmental cases are extremely difficult due to their complexity, specialized nature, and the implication of local interests. The fact that Sheng-Li began illegal disposal of Eternal Chemical Co.'s hazardous liquid wastes as early as 1997, but was not discovered until today, shows that there is clearly a problem. Minister Chen thus recommended attacking the problem through stronger executive agency controls, inspection, and legal amendments.

Minister of Economic Affairs, Lin Hsin-yi, pointed out that to reward companies for investing in the environmental industry, the MoEA has already drafted, "Regulations for the Promotion of Green Technology." The environmental industry has also been listed as one of Taiwan's important emerging strategic industries. Future investments in green industries will be granted tax exemptions and other preferential treatment.

The industry representative in attendance pointed out that the problem today is not with the majority of companies, but with a few unlawful enterprises. Taiwan's laws are often set too strictly, which creates problems for legal enterprises but makes things even easier for illegal operators. The industry representative also expressed that authority for matters of waste treatment is too dispersed in Taiwan's government. As a result, the MoEA, Ministry of Education, and Department of Health, must all have personnel specializing in industrial waste. From the perspective of a private enterprise, this doesn't make sense in terms of cost and benefit. Industry thus favors creation of a single government industrial waste authority.

The environmental groups present, however, felt that the old government consistently gave priority to economic development at the expense of the environment. They thus welcomed entry of the Ministry of Justice, noting that most environmental cases involve behind the scenes manipulation by interest groups and are beyond the public's ability to handle. A representative from a women's group with environmental interests expressed hopes on behalf of Taiwan's housewives and children in hoping that the new government can, "Just do it," and let the public rest easy on this land. The Executive Yuan noted that it would organize attendees recommendations and give them to respective agencies as a reference for their future efforts. ♻️

EPA Launches Comprehensive Wastewater Inspections

To resolve the longstanding problem of river pollution, the EPA has proposed control strategies based on the characteristics of different pollution sources. For pollution stemming from fixed-location legal factories, the EPA will thoroughly check pollution discharges and review permits for nearly 23,000 industrial enterprises. The review will allow the EPA to understand any recent changes in discharge status. The EPA will also work with private groups to begin long term supervision of select water pollution sources. The EPA estimates that control goals can be met within a year and a half.

After occurrence of the Kaoping River dumping incident, the EPA organized a comprehensive review of industrial wastewater management policies. At a press conference held August 15, Director General of the Bureau of Water Quality Protection, Roam Gwo-dong (阮國棟) declared the EPA's intention to resolve longstanding river pollution problems through comprehensive investigation of industrial effluent discharges. Roam emphasized the EPA's "never give up" determination to solving this problem. The EPA's control goals will be reached through detailed checks on Taiwan's some 23,000 legal enterprises, to be carried out in three stages over a year and a half.

The EPA points out that an initial analysis identified four main types of pollution sources. Type one consists of legal, fixed-location factories, livestock farms, and building structures; type two consists of illegal, fixed-location factories (for example, unregistered factories); type three includes fixed pollution sources that are able to relocate or disappear in reaction to regulatory enforcements or bans, (such as illegal riverside cultivation or trash disposal sites); type four refers to mobile pollution

sources whose locations are difficult to predict (such as illegal dumping activities). The EPA has proposed specific control strategies based on the characteristics of each pollution source.

The first stage of the Water Bureau's plan for controlling pollution sources will consist of comprehensive checks, carried out over three months, to review changes in wastewater discharge as reported by legal industrial enterprises. By law, enterprises are required to report such information and make alterations or reapply for permits when necessary. During the second stage of the plan, nine months in length, in-depth investigation of major fixed pollution sources will be carried out. In the third stage, selected enterprises will be required to report performance information, such as water and sludge quantities, which will be released publicly. During the six months of the third stage, private groups will carry out a trial supervision of industrial pollution sources. While it is not possible to review reporting records for illegal enterprises, investigations carried out will include illegal, fixed-location factories. During implementation of the plan any enterprises discovered falsifying reports on wastewater volumes or violating operating regulations for wastewater treatment facilities will be strictly punished.

According to Articles 16 & 36 of the *Water Pollution Control Act*, enterprises using hidden pipes, secretly installed to illegally discharge effluent, will be fined on a continual daily basis between NT\$60,000 to NT\$600,000. For serious violations, the enterprise may be ordered to suspend operations and the responsible party incarcerated

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for up to one year. According to Articles 33 & 37, false reporting may lead to incarceration for up to three years for responsible parties, legal representatives, workers or employees related to the enterprise. Article 14 stipulates that enterprises that have not responded to discharge permit changes can be fined between NT\$60,000 and NT\$600,000. For serious violations the enterprise may be ordered to suspend operations and the responsible party incarcerated for up to one year.

In reaction to wanton dumping by illegal waste service providers, such as Sheng-Li Co., because

their movements are difficult to predict local governments are scrambling to establish self defense measures (see article on page 7). Director General Roam expressed willingness to cooperate with formation of local river patrol teams. For example, the EPA has already subsidized the governments of Kaohsiung County, Kaohsiung City, and Pingtung County a total of NT\$18 million to establish the "Kaoping River Patrol Team". In addition, the EPA has begun onsite assessments of the Erhjen River (二仁溪) in Tainan County and City, the Tahan River (大漢溪) in Taipei and Taoyuan Counties, and the Keelung River (基隆河) in Taipei County and Keelung City. 

FPC to Begin Treatment of Mercury-tainted Sludge

Following the return of mercury-tainted sludge to Formosa Plastic's Jenwu facility, FPC has begun preparation for heat treatment of the sludge. To overcome public concerns about treatment of the sludge, the EPA has invited local community representatives and objective individuals to form a monitoring task force that will oversee the process. After completion of relevant legal procedures, FPC expects to begin treatment at the end of August.

In June of this year, the Formosa Plastics Corporation (FPC) returned 325 containers of mercury-tainted sludge to its Jenwu facility for treatment. The sludge had captured world attention following its shipment to Cambodia and subsequent illegal dumping in late 1998. The waste was repatriated from Cambodia to Kaohsiung Harbor in early April of 1999. However, strong reservations about sludge treatment by local communities prevented the waste from being returned to any FPC facilities prior to June of this year. As a result, the waste was temporarily stored on board a vessel in Kaohsiung harbor for over 14 months. Now, the EPA, the Kaohsiung County Environmental Protection Bureau (EPB), and the Jenwu township government have formed a technical monitoring task force to oversee the operation. Through performing the treatment process in a transparent manner, it is hoped that the concerns of the public can be assuaged.

FPC reported that activities such as heat treatment to recover mercury wastes can commence once the Kaohsiung EPB approve a test-run of the treatment procedures. At an August 11 meeting convened by the EPA, the technical monitoring task force overseeing FPC's treatment activities passed a resolution stating that, after EPB approval, the group will proceed to the Renwu site on the first day of the test-run to begin supervising the process.

An FPC representative stated that preparations for the test-run, including sludge treatment equipment, pollution control equipment, pulverization equipment, and QA/QC monitoring, have been completed. On July 4, FPC completed both an empty run and a test operation on dry soil. According to the EPA's review process, the time for the test-run is fast approaching. On August 7, FPC submitted a "Pre-test Burn Test Run Operation Plan" to the Kaohsiung County EPB. The final step will be receiving the EPB's go ahead.

A delay in beginning treatment has been caused by differences between the EPB and FPC over the permits necessary for the operation. Because the process will recover mercury from the waste sludge, the EPB requested FPC to apply for a manufacturing permit. FPC believes a waste treatment permit to be sufficient. EPA Deputy Administrator Lin Tashiung (林達雄), who concurrently serves as Convener of the aforementioned task force, mediated the dispute, and reported that once approval from the EPB has been received, the task force will be on hand to oversee the operation. The monitoring procedures will be open to the public, and will begin with the opening of the containers and sampling of the mercury-tainted sludge.

FPC has indicated that in order to prevent secondary pollution, QA/QC control procedures will be followed by a TCLP test to ensure that the resulting sludge has mercury levels below the legal limit of 0.2 mg/l. Following treatment, the sludge will be sealed carefully and then made into bricks for reuse. Members of the technical monitoring task force expressed their hope that the remaining mercury content of the sludge can be less than 2 parts per million, even though regulations do not require such a low level. 

Environmental Protection Plans to Reflect Local Character

The National Environmental Protection Plan (NEPP) calls for formulation of local environmental protection plans. The EPA established a technical service group and organized a number of seminars and workshops to help local governments with this work. The EPA also aims to ensure that individual plans maintain local characteristics while still falling in line with the overall NEPP framework.

The *National Environmental Protection Plan* (NEPP) has been in effect for over one year now. Under the NEPP city and county governments are required to draft environmental protection plans divided into the short, medium, and long-term. However, due to differences in structure and goal setting in the plans drafted by respective governments, a degree of integration is still required. For this reason, on August 14 the EPA called a national meeting to explain to local governments how to better handle formulation of local environmental protection plans, perform progress evaluations, and address other problems areas.

The meeting was chaired by Professor Lee Kung-zhe (李公哲) from National Taiwan University's Graduate Institute of Environmental Engineering. Professor Lee stressed that if any uncertainties remains for city or county governments after the meeting, the EPA's technical service group is available specifically to provide this type of assistance. The group was established by the EPA to ensure that local governments can formulate truly implementable environmental protection plans.

Another professor in attendance pointed out that the development of local environmental protection plans must proceed in accord with the goals and spirit of the NEPP. Secondary to this should be reflection of local environmental circumstances and the disposition of local decision makers. Plans should also allow local residents to clearly understand and track their progress, problems, and measures adopted. For this reason, execution of local environmental protection plans should primarily be guided through an assessment process based on quantifiable indicators, set in accordance with NEPP goals.

The *Taipei City Environmental Protection Plan* is a good example of a goal oriented local environmental protection plan. For example, the plan, divided into short-term (2001), medium-term (2006) and long-term (2011) goals, aims to achieve recycling rates of 25%, 45%, and 50% respectively. After Taipei City implemented a "per bag trash collection fee" this July, recycling rates jumped from

2.5% to 10.3%, but still fall well short of the 25% goal set for 2001. The Taipei City Department of Environmental Protection pointed out, though, that after recycling of kitchen leftovers begins the 25% goal is within reach.

The character of Hsinchu City is defined by its science park, which has made Hsinchu City the capital of science and technology in Taiwan. The *Hsinchu City Environmental Protection Plan* strives to incorporate both sustainable development and science and technology management. The plan is devoted to the vision of a, "beautiful Hsinchu, home of science and technology." It aims to stimulate an environmentally friendly industrial culture, and encourage residents to take part in creating a Hsinchu City where environment and economic development exist in harmony.

The Director General of the EPA's Bureau of Comprehensive Planning, Ni Shi-biao (倪世標), noted that the 1998 NEPP passed by the Executive Yuan fixed environmental goals to be met by the year 2011. National policy set in the plan stipulates that integration of, "production, ecology, and livelihood," within the greater environmental whole is equally important as economic development. Because each area has a unique environment, local environmental protection plans are needed to ensure that national level goals in the NEPP are attained. For example, population density in Taipei City makes cars and motorbikes the primary cause of air pollution, while in Kaohsiung industrial emissions are the main culprit. Obviously, alternative enforcement strategies are necessary to deal with such discrepant conditions.

In addition to completing NEPP promotion plans for the years 1999 & 2000, the EPA also organized a number of seminars, forums, and workshops to help local governments with formation of environmental plans. Furthermore, the EPA established a technical service group specifically dedicated to this purpose. Such efforts help the EPA get a better grip on overall NEPP progress and to promote joint central and local environment protection efforts. For example, the "National Environmental Protection Plan Promotion Strategy Forum", was organized to explore strategies for promoting conservation and pollution prevention. The forum aimed to develop implementation strategies and other courses of action to flesh out the NEPP, and provide a reference for local governments to amending their own work strategies. 

Feature Article

Dual Approach Alleviates the Effects of Acid Rain

Collection of the air pollution control fee began in 1995. In conjunction with low sulfur fuel policies aimed at controlling pollution at the source, this dual approach has reduced industrial sulfur oxide emissions and gradually lowered airborne concentrations of sulfur dioxide in the Taiwan region. From the 1994 average of 8.1 ppb, sulfur oxide concentration dropped to 4.7 ppb in 1999, a 42% improvement. Average SO₂ concentrations in the first half of 2000 further dropped to 4.3 ppb, lower by 22% than the average value for the past three years at the same time.

At an August 8 press conference on implementation of the air pollution control fee, EPA Deputy Administrator, Lin Ta-hsiung (林達雄), took time to explain recent achievements in controlling sulfur oxides (SO_x). Lin pointed out that in 1998 the average sulfur dioxide (SO₂) concentration in the Taiwan region was 5 ppb. Taipei City recorded an average concentration of only 4 ppb, significantly lower than many other well known capital cities. For example, London averages 11 ppb, Berlin 9 ppb, Paris 10 ppb, Brussels 8 ppb, New York 9 ppb, Tokyo 9 ppb and Hong Kong 11 ppb.

Director General of the Bureau of Air Quality Protection and Noise Control, Chen Hsiung-wen (陳雄文), further pointed out that reductions in airborne SO_x concentrations have brought improvement to the acid rain situation. Acid rain is defined as rain with a pH value below 5.0. Average pH values at the Taipei monitoring station improved from 4.27 in 1991 to 4.54 in 1999. This equals a 50% improvement rate. Kaohsiung station recorded a change in average pH values from 4.49 to 4.73 over the same period of time, a 42% improvement rate. Although metropolitan areas still exhibit some

rain acidification, steady progress is being made. Monitoring stations in suburban areas show that places such as Kenting, Taimali, Chiayi, Penghu, and Alishan do not have an acid rain problem.

Airborne sulfur oxides have adverse effects on the human respiratory system, in addition to giving rise to both acid rain and suspended particulates. The major sources of SO_x come from combustion of coal, industrial fuel oils and vehicular diesel fuels. Fuel combustion generates SO_x and nitrogen oxides (NO_x). Chemical reactions in the atmosphere then give rise to sulfuric and nitric acids, which dissolve in water and precipitate as acid rain. Director General Chen noted that the proportion of sulfates found in rain water decreased 27% from 1991 to 1998, a noticeable improvement.

Besides obvious improvements in air quality, the effects of the air pollution control fee are apparent in pollution source emissions as well. The Air Bureau noted that before collection of the air pollution control fee, most factories treated SO_x emissions to just within required limits, and did not operate control equipment to attain the greatest removal efficiency. After the air pollution control fee was initiated, factories obtain greater fee exemptions the larger the degree of SO_x reduction. The fee also caused enterprises to begin purchasing low sulfur fuels or switching over to natural gases, and accelerated the installation of SO_x control equipment. Economic incentive further ensures that prevention equipment is faithfully operated. Since fee collection began, pollution control measures have accounted for SO_x reductions of around 126,000 tons annually, and total investment of over NT\$100 billion. (see chart below). Currently the Taiwan area

Measure	Method	Estimated SO _x Reductions (1,000 tons/year)	Investment (NT\$100 million)
Increase installation of SO _x control facilities	Installation of Exhaust Desulfurization Facilities	81	162
Use cleaner fuels	Increase use of natural gas	42	962.5
Other reduction measures	Process improvement reductions or increased removal efficiency	3	0.2
Total		126	1124.7

has 42 sets of exhaust desulfurization equipment, an increase of 12 since collection of the air pollution fee began. Furthermore, their operating efficiency has increased from around 60% to over 90%.

In terms of fuel selection, the push and pull of both incentives and controls have caused industries to begin the switch over to cleaner fuels. Currently, industrial fuel oils with sulfur content below 0.5% make up 2/3 of national consumption. Further, after 1998, it was nationally mandated that sulfur content in diesel fuel must be below 0.05%, comparable with advanced countries. In terms of imported coal, in 1994 average sulfur content for imported fuel coal was 0.73%, but after collection of the air pollution control fee began in 1995 average sulfur content was reduced to 0.55% and

subsequently 0.46% by 1998.

The Air Bureau noted that future SO_x control strategy will focus mainly on fuel controls, tightening emissions standards for power generation, and total emissions quantity control. For example, gradually implemented fuel controls will eventually lead to comprehensive use of 0.5% sulfur content industrial fuels for Taiwan's west coast. In the Chu-Miao (竹苗) and Yun-Chia-Nan (雲嘉南) air quality control zones, mandatory use of fuels with 0.5% sulfur content will be phased in, and new pollution sources will be encouraged to use low pollution fuels (such as natural gas or liquefied petroleum gas). In addition, SO_x emissions from coal-fired power plants will be tightened from 500 ppm to 200 ppm in July 2001. 

EPA Supports Joint Kaoping River Rescue Program

Local government leaders from Kaohsiung and Pingtung recently proposed a "local river rescue" program to prevent water source pollution. The proposed program would establish joint "river defense teams" to protect water quality. Administrator Lin expressed his approval of the initiative, and will provide both enforcement and financial support. In addition to providing a hope of improving water quality in the Kaoping river, the program also offers a model for integration of local and central government efforts.

Spurred to action by the Kaoping River dumping incident, on July 26 the administrative heads of Kaohsiung City, Kaohsiung County, and Pingtung County (the "Kao-Kao-Ping" region) traveled north to pay a visit to EPA Administrator, Edgar Lin. The three leaders explained to Administrator Lin a joint, "Kaoping River Local Rescue Program," (高屏溪特別自救方案) and sought central government support. Lin on the spot promised full support, both enforcement and financial, for all aspects of the program, from river remediation and industrial waste inspections to tackling criminal involvement. Lin further expressed hopes that results would be forthcoming in the next six months.

Administrator Lin noted that environmental protection requires, "global thinking and local action," and must be promoted from multiple directions. He stated that the Kaoping River dumping incident proves that environmental problems cannot be solved by isolated government efforts. Lin expressed his joy that the three Kao-Kao-Ping leaders will form cross-jurisdictional "river defense teams" (河川自衛隊), and that such cross-district

integration sets an excellent example for future central and local government efforts. If successful, Lin hopes to promote the model to all counties and cities in Taiwan.

The eight points laid out in the, "Kaoping River Local Rescue Program," comprise the first cross-district local rescue action taken in Taiwan. Kaohsiung County Magistrate, Yu Cheng-Hsien (余政憲), expressed his hopes that the EPA will provide budgetary assistance for the program. He also pointed out that the three local governments have already organized police to patrol the Kaoping river and prevent illegal waste dumping by criminal groups. He also hopes that the EPA and Ministry of Justice can take measures to facilitate legal procedures for dealing with such environmental hoodlums. Magistrate Yu expressed his thanks to Administrator Lin for his support, as well as noting that the broad course of the Kaoping river basin binds together the livelihoods of Kaohsiung County, Kaohsiung City, and Pingtung County in a common framework.

Kaohsiung Mayor, Frank Hsieh (謝長廷), noted that issues of public safety, such as waste disposal, are a ticking time bomb. Local governments, and not only the central government, are responsible for taking immediate action. However, he also believes that responsibility for at-source management does lie with the central government, while end-of-the-line enforcement, such as audits or inspections, should be performed by local

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governments. He further stated that the river defense teams must be immediately formed to take on environmental hoodlums, and that the names of anyone trying to illegally influence the teams should be publicly announced. Mayor Hsieh expressed hopes that the program can set a good example for integration of central and local government powers and responsibilities.

Pingtung County Magistrate, Su Jia-chyuan (蘇嘉全), expressed his gratefulness for the EPA's offer of assistance, and stressed the three leaders' determination to defend water quality in the Kaoping River. Magistrate Su expressed his joy that the three areas are abandoning selfish regionalism and embarking on mutual cooperation. For instance, although Kaohsiung City is located at the lower reaches of the Kaoping river, it is still willing to invest in remediation for the entire river length. Furthermore, in the future local police stations will also join together to crack down on illegal dumping activities.

Illegal operators harming the environment are

incredibly difficult to prosecute, and frequently disappear before outstanding fines or penalties can be collected through the court system. However, to freeze the accounts of such parties before they can disappear, local governments must first pay a court bond. Because of their limited means, the three leaders requested the EPA to provide financial vouchers which the three governments can apply for when taking legal action against unscrupulous enterprises or environmental hoodlums. They also expressed hope that the EPA be more active in carrying out policies for the removal of livestock from water resource areas and at-source industrial waste control, as well as assist in establishment of a Kao-Kao-Ping cross district monitoring network.

In response to their requests, Administrator Lin asked the EPA to begin immediate research on the subject. He promised the greatest support possible as a model for integrating efforts between central and local environmental agencies. In terms of budgetary assistance, the EPA granted subsidies of NT\$6 million to each of the three local governments to aid in carrying out necessary patrol and inspection work for this year. ☺

Industrial Pollution Leading Cause of Public Complaints in 1999

The EPA has released the 1999 White Paper on Public Nuisance Complaints. The White Paper shows that in 1999 environmental agencies handled 93,555 pollution complaints, an average of 1 complaint every 5.6 minutes. Statistics show that the public is most concerned by solid waste and noise pollution, while industry led as the greatest source of pollution complaints.

On August 1 the EPA released the "White Paper on Public Nuisance Complaints". The White Paper contains an explanation of the EPA's policy for handling pollution complaints and many statistical analyses. Statistics revealed a total of 93,555 pollution complaint cases in 1999, an average of one case every 5.6 minutes. Industry again led the list as the major source of complaints.

When complaints are divided by pollution source, industrial (25.6%), residential (24.7%), and commercial (16.8%) rank in as the top three. The statistics show a closing gap between industry and household residents as pollution sources in public complaints. As for other pollution source trends, transportation vehicles exhibit the highest rate of growth, 466% over seven years, followed by residential at 58.8%, and commercial at 36.3%. The number of complaints rising from industrial pollution

sources has stabilized.

Divided by pollution type, the leading three causes of complaints were solid waste (including general environmental sanitation) at 34.4%, noise at 23.6%, and odor (not including air pollution) at 21%. The statistics show that solid waste and noise are the items of greatest public concern across Taiwan. Also important to note, the number of complaints stemming from odorous air pollution rose 250% over seven years. This is the highest rate among pollution types, exhibiting growth every year. Solid waste complaints grew 85.4% over seven years, ranking in at number two.

Shown by region, complaints were highest in Taipei City at 22.7%, Taipei County at 18.8%, and Kaohsiung City at 6.4%. The number of pollution complaints increased most rapidly in Pingtung County, growing 97.8% over seven years. The numbers show different trends in pollution complaints based on the character of different counties and cities. The White Paper also reveals that Taiwan's citizens have increasingly high expectations for quality of life and for their environmental agencies.

The EPA pointed out that the average time required to handle a case dropped from 20.1 days in 1992 to 1.1 days in 1999. In addition, environ-

mental agencies improved the average time required to report back to the public and now close a greater percentage of their cases. Taiwan residents can file complaints 24-hours, islandwide using the EPA's reporting line (080-066666). Complaints can also be filed by email, letter, personal visit, or dispatching a public representative. However, in terms of

noise and odor, which together account for 44% of all complaints, difficulty in assessing violations resulted in a gap between public expectations and government performance. To prevent public dissatisfaction, the EPA will strengthen guidance and auditing, as well as reexamine the issue during legal amendments. ●

EPA Takes Emergency Measures to Resolve Medical Waste Problems

With the recent ordered work stoppages of local medical waste treatment facilities, Taiwan faces a severe buildup of untreated medical waste. To deal with this dilemma, the EPA and Department of Health have proposed a four-point emergency plan that includes coordinating waste disposal with existing facilities and treating waste through high temperature sterilization and cold temperature storage. The EPA has also stated that it will exercise government authority to overcome illegal protest activities.

Recently, there has been a sudden increase in the storage of yet-to-be treated medical waste. Following an emergency meeting with the Department of Health, the EPA on August 18 decided to allow medical institutions to send their waste to general refuse incinerators following heat or chemical sterilization treatment.

EPA officials pointed out that the existing domestic medical waste treatment facilities can handle about 90 tons of infectious waste per day. Under normal circumstances, this capacity is sufficient to treat the 49 tons per day produced by local medical institutions. The current problem arises from the fact that local-level governments have restricted the cross-border movement and cross-facility treatment of medical wastes. In addition, fees levied by treatment firms are excessively high.

The EPA further indicated that on top of the ban that cities and counties impose on treating other areas' waste, recent public protests have prevented counties such as Miaoli, Hsinchu, and Changhua from operating or building medical waste incineration plants. These obstacles have dropped Taiwan's ef-

fective treatment capacity to 18 tons per day. This extreme shortfall has wreaked havoc on the island's waste treatment market and led to stockpiling of waste that should be treated.

The Bureau of Solid Waste Management stated that to deal with this emergency situation, in addition to accelerating the review process for waste treatment licenses, the EPA has adopted four emergency measures:

1. Undertake emergency coordination with local city/county governments to allow incineration of stockpiled medical waste in medical incinerators with excess capacity.
2. Work with the Department of Health to increase treatment capacity by lengthening the operation time of medical waste incinerators at public hospitals.
3. Temporarily permit the cold temperature storage of medical waste; if kept under 4°C, storage will be allowed for one month; if under 0°C, was can be stored for three months.
4. Allow infectious waste to be treated in general refuse incinerators provided the waste has been sterilized using high temperature, high pressure methods.

On August 18, the EPA expressed its desire that the local governments of Kaohsiung County and City, Taichung County and City, and Miaoli County exercise their rights to end public protests regarding medical waste treatment. These efforts will be crucial for putting in place a safe and effective island-wide waste treatment system, and to thereby avoid the spread of infectious diseases. ●

EPA Strengthens Toxic Emergency Response System

According to provisions of the Disaster Prevention and Response Act, the EPA is the lead agency for handling toxic chemical release response measures. Due to the special characteristics of toxic chemical substances, the EPA will set up a response hotline system and create standardized action procedures. The EPA will also strengthen measures such as response drills, disaster

notification and communication systems, and release-source management.

Prevention of toxic chemical disasters will soon take on new dimensions in Taiwan. Promulgation

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this year of the *Disaster Prevention and Response Act* (災害防救法) designates the EPA as the agency responsible for direction, supervision, and coordination of relevant government agencies in responding to disasters involving toxic chemical substances (hereafter referred to as toxic chemical disasters). In the future the EPA will integrate existing toxic chemical disaster response plans and develop detailed supporting regulations. The EPA will also promote joint industry prevention and response for toxic chemical disasters.

The EPA points out that the *Disaster Prevention and Response Act* is dedicated to laying out an overall prevention and response framework for all types of disasters. The goal of the Act is to protect both Taiwan and the lives, health, and property of her citizens. Toxic chemical disasters in the Act refers to any disaster stemming from one of the 252 different toxic chemical substances listed in the *Toxic Chemical Substance Control Act*. The recent occurrence of a number of public safety and pollution incidents has increased public demand for control of toxic chemical substances. Because a toxic chemical disaster would have severe environ-

mental repercussions, passage of the *Disaster Prevention and Response Act* will allow the EPA to pursue more aggressive controls on toxic chemical substances.

The EPA notes that each year between four and eight incidents involving toxic chemical substances occur in Taiwan, and that most incidents are caused by vehicle accidents during transportation. Although no incidents have yet led to a large scale disaster, prevention efforts are in urgent need of strengthening. According to the *Disaster Prevention and Response Act*, upon occurrence of a toxic disaster, local governments must take immediate response measures. After occurrence of a grave disaster, the central government may also establish a disaster response center and send personnel to assist with local efforts.

In terms of disaster response preparation, the EPA is taking steps to strengthen coordination of manpower and equipment used for rescue efforts between fire and disaster response agencies. The EPA will also strengthen its information system for providing technical assistance on toxic chemical disaster prevention and response, as well as establish a 24-hour technical assistance center. Additional EPA efforts include developing emergency response

News Briefs

President Chen Commits to Speedy Improvement of Drinking Water in Southern Taiwan

On August 5, President Chen Shui-bian promised to earmark NT\$15 billion between 2001 and 2003 for the improvement of water quality in the Kaohsiung regional water district. For the first year, NT\$3 billion has already been committed and will be used for construction of a high-quality clean water treatment plant and to merge the Nanhua Reservoir and Kaoping Weir water systems. As for the separation of water quality management authority, Chen stated that the government will work to unify regional authority through a two-stage process.

Drinking Water Quality Non-compliance Rate at 0.45%

Results from island-wide analyses of tap water quality in the first half of 2000 were recently released. The total non-compliance rate for the six month period was 0.45%. The highest non-compliance rate in Taiwan was in Penghu County, where 6.11% of the samples taken did not meet standards. Taipei City and thirteen other cities and counties had 100% compliance rates. In addition to tap water, environmental agencies sampled other sources of drinking water and found that out of 186 cases, 61 did not comply with standards. This rate (32.80%) was lower than last year's rate of 44.10%.

Prosecutor Seeks Life Sentences in Kaoping River Pollution Incident

On August 15, the Kaohsiung Prosecutor's Office completed its investigation of the recent solvent contamination of the Kaoping river. The Office charged 24 entities (including Sheng-Li Chemical Company, Eternal Chemical Company, and 22 individuals) with crimes ranging from attempted murder to public endangerment. The prosecutors will seek life sentences for the Chairman of Eternal, the President and Vice-President of Sheng-Li, as well as two of the drivers involved in the actual dumping. In addition, the local water company has hired lawyers to seek NT\$280 million in damages from Sheng-Li and Eternal.

EPA to Hold International Training Course for Environmental Professionals

The EPA will be holding the International Training Course for Environmental Professionals on November 6-10, 2000 in Taipei, Taiwan. The training program will cover environmental policies, strategies, and measures in the areas of environmental impact assessment, air pollution, water pollution, and waste management. The five day program is designed for mid- to high-level staff members (section chief or above) in environmental agencies in the Asia-Pacific region. Malaysia, Indonesia, the Philippines, Vietnam, etc. will be invited to send participants to the event.

procedure cards and a Chinese version CD-ROM data bank on toxic chemical substance toxicology and response. The disks will be provided to all relevant agencies to assist with rescue drills, notification procedures, and at-source management of toxic chemical substances. Further, the disks will help industries raise awareness, carry out training, and set up an on-time mutual support system. Through a joint Taiwan-US cooperation plan, over the last two years the EPA researched and developed software for modeling toxic chemical disaster dispersion. It is the first domestically completed disaster rescue dispersion model, and can be used for educational training, development of emergency response plans,

and as an important guide for first line response personnel.

As required by the *Disaster Prevention and Response Act*, the EPA will integrate existing toxic chemical disaster response plans and propose detailed supporting regulations, which should be reported to the Executive Yuan by October of this year. The EPA points out that strengthening prevention is the only way to reduce the risk of a disaster occurring. The EPA called upon all sectors to pool their resources and promote toxic chemical substance disaster prevention and response efforts in order to protect the lives and property of Taiwan's citizens. ●

Young Professors Give Suggestions on Environmental Protection

On September 7 the EPA held a discussion forum for young professors to aid in the formulation of environmental protection policy and build a greater consensus among environmental scholars. After a day of discussions, the attendees proposed concrete suggestions for improving waste management, sewer construction, air quality indicators, and environmental education and policy.

On September 7 the EPA organized an environmental discussion forum for young professors. A total of 112 professors from across the nation and EPA Administrator Edgar Lin sat together at the EPA to discuss the future of environmental protection in Taiwan. While commenting on the surge of complex environmental problems occurring of late, Edgar Lin again reiterated, "Environmental problems cannot be solved merely by reliance on technology!" He asked the EPA to carefully study suggestions and conclusions made at the forum.

Administrator Lin said, "When I first returned to Taiwan 20 years ago and saw the deplorable state of Taiwan's environment, although I was concerned and felt compelled to act, I had no channel thru which to participate." He continued to say, "Today I see the abundance of environmental talent in Taiwan, and I understand how all of you feel. The atmosphere today is different, and Taiwan can accept many different voices. Especially in the environmental field we need everyone to take stock of the situation and offer their suggestions."

Five major issues were covered during the forum. These included, (1) solving the problem of industrial waste; (2) improving urban air quality; (3) improving water pollution and water sources; (4) promoting environmental ethics, education, and full public participation, and (5) putting-in-place a fair environmental policy making process.

After discussion, the attendees reached a to-

tal of 37 concrete conclusions, and came up with 110 suggestions. Some of these include :

1. Accurate information on industrial waste volumes is a prerequisite to reducing industrial waste. Manpower dedicated to auditing and verifying waste reporting should be increased. Further, persons preparing waste reports should bear joint legal liability.

2. Construction of industrial waste treatment and disposal facilities is often blocked by local protests. The government should take responsibility for removing such obstacles and arranging reasonable compensation for local residents.

3. It is recommended that hazardous air pollutants and sensory indicators (such as visibility or resident sentiments) be included in air quality management policies.

4. A mechanism for regular cross-ministerial meetings should be established to accelerate formulation of control strategies related to commuter vehicles, transportation, and petroleum products.

5. Accelerate construction of sewer systems and set a clear timetable for construction progress based on the accomplishment of water quality objectives.

6. Increase punishments for environmental crimes and establish an explicitly defined penalty system.

7. Actively promote legislation of the *Environmental Education Fundamentals Act*. The framework and functioning of the environmental education system must be strengthened, and an online national environmental education web should be established.

8. Coursework in environmental ethics should be included at all levels of education, especially the technical and engineering education systems.

9. Establish an effective communication mechanism to ensure that policy decisions are made through a process of open and transparent discussion. ●

River Inspections to be Strengthened Through Aerial Surveillance

In order to overcome current limitations on inspecting river pollution, the EPA will cooperate with the Air Force to perform inspections from the air. Aerial photos will be used to create a database with records of major pollution in Taiwan's rivers. When pollution sources are discovered from the air, ground-based environmental inspectors will be dispatched to the sites in question.

As part of his efforts to expand environmental inspection activities, EPA Administrator Edgar Lin has instructed a database of aerial photographs of major pollution in Taiwan's rivers to be created. On August 18, Administrator Lin, the Taichung County Magistrate, and the Director of the Taichung Environmental Protection Bureau boarded a helicopter to perform an airborne inspection of several rivers in central Taiwan. Administrator Lin urged environmental officials to use a bird's eye view to inspect river systems that, due to rough terrain, are difficult to monitor from the ground. Information obtained through such aerial scrutiny will help in the prosecution of illegal activity.

Administrator Lin stated that following the recent incident in which the Kaoping River was contaminated by industrial solvent wastes, the EPA intends to beef up controls on illegal waste dumping and other sources of river pollution over the short-term. During the next six months, the EPA will cooperate with local government inspec-

tors to perform the following activities –

- study the connection between major river pollution and industrial park effluent,
- investigate the illegal dumping of waste in major rivers and in mountainous areas, and
- inspect sources of river pollution, especially illegal waste dumps.

In addition, a photographic database of the pollution in Taiwan's rivers will be created by taking aerial photographs and videotape. Sites listed for inspection will be monitored from the air as a means to prevent pollution incidents. Lin further requested that environmental officials redouble their efforts to fight criminal activities. He also urged the public and government agencies to provide their full support in this endeavor.

EPA officials also stated that when aerial inspections identify pollution sources, ground-based inspectors will be contacted and dispatched to confirm the source and create the necessary documentation. If necessary, legal proceedings will be initiated and follow-up inspections performed.

The EPA urges the general public to do their part in preventing incidents such as the recent solvent contamination of the Kaoping River. The shortage of environmental personnel makes this all the more necessary. The public should help combat pollution by reporting illegal dumping to the proper authorities. 

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