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Taiwanese consumers use over 10 billion plastic bags every year. These bags, being non-biodegradable, inflict serious damage on Taiwan's environment. Addressing this situation, the EPA has formulated the Three-stage Timetable for Restricting the Use of Plastic Shopping Bags, which will commence the phasing out of plastic bags in May 2002.

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EPA statistics reveal that the nation's environmental authorities received a total of 102,200 environmental complaints in 2000. Of these, complaints about waste and environmental sanitation accounted for the largest number—32,875 (32.17%). The second-largest category consisted of noise pollution complaints (26,158; 25.59%); the EPA has decided to revise laws to facilitate resolution of noise pollution incidents.

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Soil and Groundwater Pollution Sites to be Cleaned up in Three Categories

Controversy surrounding the collection of soil and groundwater pollution remediation fees and the discovery once again of cadmium-tainted rice highlights the importance of pollution remediation work. With the EPA's Soil and Groundwater Pollution Remediation Fund Management Committee soon to be formally established, we can imagine the public's anticipation concerning the operation of the fund and the promotion of pollution remediation work.

With the collection of soil and groundwater remediation fees scheduled to commence on November 1, the public and petrochemical enterprises are highly concerned about the problems surrounding this fee collection and subsequent remediation work. It is easy to imagine the reaction of enterprises to the collection of remediation fees during these hard economic times. However, the recent discovery once again of cadmium-contaminated rice all the more highlights that there is no time to waste in putting soil and groundwater pollution remediation plans into action.

In response, the EPA has on the one hand decided to collect remediation fees in two stages in order to lighten the financial burden on enterprises. On the other hand, the EPA recognizes that fee collection is merely the first step in pursuing remediation plans and that how to go about implementing remediation projects is actually the most important issue, and the one that most concerns the public. Aiming to address these issues, we have interviewed Soil and Groundwater Pollution Remediation Fund Management Committee executive secretary Chien-hui Lin (who is a senior specialist at the Bureau of Water Quality Protection), focusing on the major issues surrounding soil and groundwater remediation work in the near future.

Remediation Fund Fee Collection Plan

Lin spoke first on fee collection methods, the issue that has drawn the most attention from enterprises. He stated that, while the government and enterprises achieved a consensus to adopt "the polluter pays" principle following numerous discussions and public hearings, the issue of fee collection standards and timing remains controversial. The EPA, after much consideration, has chosen to collect remediation fees in two stages under this "the polluter pays" principle. During the first stage, which runs from this November to the end of 2002, collected fees will be allocated for conducting pollution surveys and estimating the costs of remediation work. During the second stage, these fees will be used to fund the actual clean up of pollution sites. It

is estimated that this remediation work will require over NT\$ 1 billion annually. The EPA has already submitted its fee collection regulations to the Executive Yuan for approval. These regulations are expected to be approved and announced by the end of October; fee collection will begin upon the announcement of these regulations. The EPA estimates the fund will collect NT\$ 150 million in fees this year and NT\$ 1.37 billion in fees in 2002. The EPA will conduct regular evaluations during the first stage in order to determine whether, for the second stage, any adjustments need to be made to fee collection standards or the range of targeted enterprises.

Selection of Committee Members Emphasizes Professional Background and Fund Operation

In addition to securing funding sources, the management and operation of the fund are also crucial to the smooth implementation of remediation work. Lin, noting that the committee is soon to be established, pointed out that the EPA has already determined its makeup and is prepared for it to begin operating. Five government representatives will sit on the committee: these are the EPA administrator, the EPA deputy administrator, the Director General of the Bureau of Water Quality Protection and a representative at the director general-level or above from each the Ministry of Economic Affairs and the Council of Agriculture. The chairperson of the Petrochemical Industry Association of Taiwan is the one committee member selected to represent the business community. In addition, 13 experts and scholars have been chosen to sit on the committee. Four of these members possess special expertise in soil remediation and three in groundwater remediation. Others specialize in law, finance, geology, chemical engineering and risk assessment. While the committee's organizational rules call for a total of 23 members, the EPA has chosen to select just 19 for the time being. Leaving the remaining positions vacant allows the committee more flexibility in selecting additional committee members in the future. The committee will conduct its first meeting in November.

Three Main Foci of Initial Remediation Work

Speaking on specific plans for remediation work, Lin pointed out that pollution sites would be divided into three categories for initial remediation work. These are: 1) sites that have been previously determined to be polluted with heavy metals, 2) sites

for which the polluters are unknown and 3) sites in industrial parks and sites polluted by special industries.

Regarding sites already discovered to be polluted with heavy metals, the EPA will first compile an inventory of each piece of agricultural land that has been identified by each county and city government in surveys of every hectare of land in their jurisdictions. This inventory will include the names of landowners, plot boundaries and plot numbers. The EPA will then use this inventory to take samples for chemical analysis. The precision this method allows will facilitate the implementation of remediation work because the EPA will be able to more accurately identify the scope and source of pollution at these sites.


As the parties responsible for polluting some sites are unknown, the government is all the more duty-bound to clean up these sites itself. Lin noted that the EPA has identified approximately 170 such sites and that it has already conducted groundwater pollution monitoring at these sites. The EPA will proceed with the necessary remediation work following the removal of dumped waste from these sites.

Also, due to the soil and groundwater pollution discovered at the numerous industrial parks around Taiwan and the soil and groundwater pollution so readily caused by such special operations as gasoline stations, leather tanneries, electroplating plants and semiconductor foundries, the EPA has chosen to define industrial parks and these special operations as one of the targeted categories in its remediation efforts. It will conduct pollution surveys

at these sites.

Expected Difficulties in the Initial Stage of Remediation Work

With funding sources secured, the goals of these remediation efforts have become clear. However, Lin conceded that, while there is a consensus as to the timing of remediation work, seeking compensation under the "polluter pays" principle would stand as one of the greatest challenges because it is difficult to identify with certitude the polluters of every pollution site. Another major problem arises from the lack of personnel. Efforts to expand the number of personnel exclusively assigned to this remediation work were rejected. Consequently those conducting remediation work must be reassigned from the current corps of EPA personnel, a move that will surely put strain on EPA personnel resources. Also, fee payments are compulsory and therefore enterprises have no choice but to make payments. However, pursuing payments and implementing this compulsory system will present a major challenge to EPA personnel and authority.

Lin declared that, in spite of the above difficulties, all assigned personnel would perform their duties with the utmost dedication in order to guarantee the success of remediation work. Their goal is to carry out the instructions of fund management committee chairperson and EPA Administrator Lung-bin Hau to quickly identify pollution sources and stop the flow of pollution. Their hard work will quell public anxiety and insure the government fulfills its duty to clean up pollution. 

Legislature Passes Revised Waste Disposal Act

The revised *Waste Disposal Act*, which resolves current waste disposal problems, establishes emergency waste disposal mechanisms and implements the resolutions of the Economic Development Advisory Committee, has been passed by the Legislative Yuan and announced by the president. The revisions raise the total number of articles in the Act from 36 to 77, lending even greater impetus to the government's waste disposal policies.

The revised *Waste Disposal Act* (廢棄物清理法) passed its third and final reading by the Legislative Yuan on October 4 and was formally enacted by the president on October 24. The revised Act will have a major influence on the future of environmental protection work in Taiwan.

The revision of the *Waste Disposal Act* was necessitated by the enactment of the *Administrative Procedures Act* (行政程序法), which requires that when the people's rights, duties or other important matters are involved, in accordance with the law or the spirit of the law, items originally belong-

ing to relatively low-level enforcement rules or regulations should be raised to the level of the original law. In addition, the *Waste Disposal Act* was revised in order to resolve current waste disposal problems, establish emergency waste disposal mechanisms and implement the resolutions of the Economic Development Advisory Committee.

Originally containing 36 articles, the revised *Waste Disposal Act* has been expanded to 77 articles. The revisions are far ranging and large in number. First, with regard to the illicit manufacturing of government-designated garbage bags, the revised Act clearly states that the counterfeiting or production by alteration of garbage bags bearing a fee verification mark is punishable with a sentence of no less than two years and no more than seven years, plus a fine of NT\$10 million. Selling such counterfeit bags is punishable with a sentence of no less than one year and no more than seven years.

Imposing heavy penalties to stamp out the counterfeiting or alteration of fee-collection garbage bags will facilitate the promotion of the per-bag fee collection system.

With regard to the EPA's plans to prohibit the use of disposable tableware and phase out the use of plastic shopping bags, because the revised Act specifies that if goods, their packaging or their containers are suspected of causing severe pollution, the central competent authorities (in this case the EPA) may announce regulations prohibiting their use or restricting their manufacture, import, sale or use.

Reflecting recent typhoon-caused waste disposal problems, the revised Act establishes emergency waste disposal mechanisms and lays out exclusionary clauses, providing for the more effective disposal of natural disaster-produced waste. According to the regulations of the revised Act, when large-scale waste clearance and disposal is needed due to natural disaster, major accident or other urgent circumstances, the EPA may, at the time of the emergency, specify disposal methods and deadlines upon seeking and receiving the Executive Yuan's approval. The EPA may, to prevent other regulations from hindering disposal progress and causing pollution to spread, waive some regulations, such as certain articles of the *Environmental Impact Assessment Act*, *Water Pollution Control Act*, *Air Pollution Control Act*, *Company Act*, *Commercial Registration Act* and *Urban Planning Act*.

As for methods of disposing of industrial waste, apart from methods specified in existing regulations, the revised Act seeks to resolve the industrial waste disposal problem by giving authorities in charge of target industries a wider range of disposal facility construction options. These options include constructing a facility, contracting out its construction or assisting in its construction. And to promote the reuse of resources, the central government authorities in charge of target industries have been made responsible for the reuse of industrial waste. This will permit central government agencies to effectively help industrial enterprises dispose of their waste.

Regarding firms' concern over their joint responsibility when waste disposal contractors violate the law, the Act safeguards legal contract disposal by stating that firms that have contracted out their waste disposal in accordance with the law and have obtained adequate verification of disposal are exempt from joint responsibility. The revised Act stipulates that the construction of waste disposal facilities in existing industrial parks and science-based industrial parks must be completed by the end of 2004 at the latest; doing so will resolve a huge per-

centage of industrial waste disposal problems.

The revised Act clearly states that waste clearance and disposal fees should be used to cover land and construction costs for the establishment of landfills and incinerators. Consequently, the Act requires that these fees be increased gradually beginning in 2001 in order to reflect this new budgeting mechanism. Because of the startling magnitude of these costs, it is expected that all cities and counties will raise their garbage disposal fees beginning this year. But while the EPA has already ordered all cities and counties to announce new garbage clearance and disposal fees based on the new costs, the cities and counties have delayed announcing new refuse fees after discovering that fees will jump to several times their previous amount. With the passage of the revised Act, failure to announce new fees will put city and county governments in violation of the law.

Apart from the major revisions mentioned above, the revised Act's revisions also provide a stronger legal basis for such policies as the planning and acquisition of sites used for waste recycling, clearance and disposal, determining the scope of waste that should be recycled, recycling labeling and the management of recycling facilities, recycling fee rates, and restrictions on the use of goods, packaging or containers that may negatively impact the environment and waste recycling clearance and disposal activities. In addition, the Act stipulates that the competent authorities of special municipalities and counties or cities may not restrict the operation of waste disposal facilities and provides legal basis for the encouragement of general municipal solid waste recycling.

As for revisions made in compliance with the resolutions of the Economic Development Advisory Committee, the revised Act establishes a legal basis for the establishment of dedicated management organizations with license-granting powers at science-based industrial parks, export processing zones and industrial parks currently under central government management.

Besides shortening the time firms need to set up plants in science-based industrial parks, export processing zones and industrial parks, the EPA emphasizes that the passage of the Act's revised articles will also increase channels for constructing industrial waste disposal facilities and allow authorities in charge of target industries to expedite disposal facility construction. These regulations will speed up the disposal of industrial waste and make establishment of joint responsibility more reasonable. Waste disposal facilities in industrial parks and science-

based industrial parks must be completed before a deadline at the end of 2004. At a time when industrial waste disposal facilities are sorely lacking, the


Drill Aims to Establish Biological-Chemical Attack Response System

The EPA conducted Taiwan's first chemical attack drill targeting a heavily populated urban area in Taipei on October 27. This exercise intended to not only increase the government's response capabilities and raise public awareness, but to also lead to the formulation of an evacuation plan and notification system.

Aiming to strengthen civil defense capabilities in the wake of the September 11th suicide airplane attacks in the United States, the EPA, in close coordination with Central Government agencies and the Taipei City government, conducted a chemical attack civil defense drill at Taipei's Hsiao Nanmen Mass Rapid Transit (MRT) station on October 27. As this was Taiwan's first chemical attack drill, Executive Yuan Premier Chang Chun-hsiung personally attended the drill with EPA Administrator Lung-bin Hau at his side. Also, the director general of the National Security Bureau, heads of other related ministries and county and city leaders were also special guests in attendance at the exercise. Premier Chang expressed his hopes that the drill would raise public awareness and improve the speed and capabilities of each government agency in dealing with this type of disaster. Chang added that the government would conduct a surprise chemical attack drill in the future.

This exercise, taking place in densely populated Taipei City, focused primarily on response and rescue measures in the event of a chemical attack. It was intended to allow the government to exhibit its emergency mobilization and response capabilities. Involving over 1,000 personnel, this drill formally took place at the Hsiao Nanmen MRT station in Taipei City on October 27. Two pre-drill rehearsals were also conducted on October 19th and 25th.


The EPA points out that biological and chemical agents are particularly threatening to the public because they have the potential to be highly destructive, to kill and injure across a large area and are difficult to defend against. Therefore, it is of the utmost importance to formulate evacuation plans and notification systems and to establish a civil defense system in order to prevent the great disaster that can result from a biological or chemical attack. An Army official participating in the drill noted that the Army has chemical agents personnel stationed in north, central, southern and eastern Taiwan. Each of these units has a rapid evaluation team and dispersal team. These teams, which can arrive promptly at disaster scenes, are able to help reduce damage

completion of these facilities will dramatically improve the situation and eliminate the problem of illicit waste dumping. 

and injuries by conducting evaluations at the scene, marking off affected areas and providing professional suggestions on how to handle the situation.

The drill simulated an attack in which terrorists release sarin gas on an MRT subway train and many passengers are overcome by the gas. MRT management, being on the first line, was to make the judgment that a gas attack had occurred after becoming aware of irregularities and receiving notification from passengers on the subway. It was then to set up a disaster response center that would coordinate rescue work among the various authorities to be called to the scene.

The authorities that participated in this joint exercise included Army units, fire departments, environmental protection agencies, public health authorities, police and transportation authorities. They each dispatched personnel and equipment to the disaster scene. Fire departments took responsibility for rescue work. Environmental protection agencies conducted preliminary assessments of whether or not toxic chemicals were present. The Army provided reconnaissance support and backup reconnaissance. Public health authorities provided medical assistance to victims. Transportation authorities were in charge of the evacuation of people and vehicles from the scene. Police insured that order at the scene was maintained. The chemical warfare units of the Army assisted with the post-disaster dispersal of the gas and the clean up of any discovered pollution.

The EPA conducts a number of drills simulating the release of toxic chemicals each year. However, these drills stage such situations as factory accidents or the explosion of an oil tanker and therefore take place in industrial parks or on roadways. This chemical attack drill differed greatly from these past exercises in that it was supposed to simulate a chemical attack by terrorists in a heavily populated urban area. It was also unique because, aiming to protect the public at large, it was intended to lead to the establishment of an evacuation plan and notification system. In addition, the EPA printed small cards and handbooks (500,000 each) detailing procedures for the public to follow in the case of a chemical attack. It has distributed these to the public and local governments in order to insure that the public gains an awareness of how to respond to such an attack. 

Feature Article

Reduction, Recycling and Reuse Guide New Waste Management Policy

The passage of revisions to the *Waste Disposal Act* by the Legislative Yuan on October 4 immediately made the EPA the target of media attention. EPA statistics indicate that waste and environmental sanitation complaints were the most common type of environmental complaints last year (2000), showing that waste disposal has become one of the most urgent problems of daily life in citizens' minds. Addressing this situation, the EPA has already presented improvement measures aimed at reducing the burden on the environment and disturbance to the public. As a follow-up to our interview with the Director General of the Bureau of Air Quality Protection and Noise Control in our last issue (EPM Vol. IV, Issue 10), in this issue we discuss a matter of keen public concern—waste disposal—with Bureau of Waste Management Director General Horng-guang Leu.

Director General Horng-guang Leu Talks About Waste Management

Director General Horng-guang Leu (呂鴻光) of the Bureau of Waste Management (廢棄物管理處) first shed light on the current state of affairs by explaining that today's waste disposal policies and ideas are significantly different from those of ten years ago. As an example, while environmental protection personnel were seen as playing the role of "environmental cops" in the past due to their heavy reliance on investigations and injunctions, they now place more emphasis on helping the public resolve waste problems, assisting city and county governments, and advising firms on waste disposal solutions. In addition, long-term waste disposal policies are being brought in line with the principles of reduction, recycling and reuse. Like a kind nanny, the EPA is painstakingly tending to Taiwan's environment and making sure it is not destroyed by waste.

Promulgated by the President on October 24, the passage of the revised *Waste Disposal Act* (廢棄物清理法修正案) (see the other article in this issue) has declared to the world that the country's waste disposal work has entered a new era. Director General Leu noted, however, that the passage of the revised Act is just a starting point. In this article, Taiwan's waste disposal undertakings and policies will be discussed from the angle of the following four aspects: (1) the *Follow-on Waste Disposal Plan* (垃圾處理後續方案), (2) recycling and reuse policies, (3) the revised *Waste Disposal Act* and (4) the *National Industrial Waste Management and Disposal Plan* (全國事業廢棄物管制清理方案).

I. The *Follow-on Waste Disposal Plan*

Before mentioning the *Follow-on Waste Disposal Plan*, the much-publicized *Waste Disposal Plan* (垃圾處理方案) must first be discussed. As for why a *Follow-on Waste Disposal Plan* is necessary at all, Director General Leu pointed out that waste disposal work has concentrated on two tasks over the past decade: One of these has been achieving

a satisfactory waste disposal rate, and the other has been instituting landfill disposal and incineration as primary and secondary means of disposal respectively. And since the disposal rate has risen past 90% over the last ten years, and new incinerators have steadily come on line, waste disposal per se is no longer a big problem. On the other hand, these goals no longer reflect contemporary environmental protection needs, and we can therefore say that the *Waste Disposal Plan* has completed its mission for this period in time. This is why the EPA is proceeding with the introduction of the *Follow-on Waste Disposal Plan*, which will be sent to the Executive Yuan for approval by the end of the year.

The first notable feature of the *Follow-on Waste Disposal Plan* is its attention to incinerator ash disposal and reuse. While Taiwan is not currently able to emulate Tokyo's no-waste policy goal, greater efforts will be made to reuse ash that has been subjected to intermediate treatment. One specific goal will be the acquisition of reuse technology for making ash into highway divider blocks, etc. A second notable feature is the acknowledgement that the privatization of waste disposal represents an inevitable trend in Taiwan. The EPA is currently promoting the construction and operation of final waste disposal sites through BOT and BOO arrangements, and hopes that the government will approve a range of incentives encouraging local governments and firms to participate in the construction of waste disposal facilities. The EPA also hopes that privatization will overcome the problem of existing waste disposal sites' inability to engage in inter-area disposal and cooperation. A third feature is emphasis on waste reduction, recycling and reuse. Vigorous implementation of waste reduction and recycling work over the past three years has yielded excellent results (see EPM Vol. IV, Issue 10). Besides continuing to implement this policy in the future, the EPA will also additionally promote reuse. Following the

final confirmation of an "incineration first" waste disposal policy, 12 cities and counties have already built incinerators. While the EPA is encouraging other cities and counties to follow suit, a variety of factors have fostered resistance to incinerator construction. Director General Leu stressed that the EPA will make continued efforts to defuse resistance with an attitude of helping the public resolve waste disposal problems.

II. The Resource Recycling and Reuse Act

The draft *Resource Recycling and Reuse Act* (資源回收再利用法) was approved by the Executive Yuan in September, and has been sent to the Legislative Yuan for review. The completion of this legislation will represent a major step forward in the recycling and sustainable reuse of resources. The existing *Waste Disposal Act*, said Director General Leu, first defines useful "materials" as "waste," and then calls for recycling and reuse. In contrast, the *Resource Recycling and Reuse Act* defines useful materials as "renewable resources" to distinguish them from "waste." While the current system emphasizes compulsory requirements and end-of-pipe controls, more stress will be placed on source management and the establishment of incentive and guidance mechanisms, with the ultimate goal of realizing a recycling-conscious society. As a good example, the EPA is in the midst of promoting the establishment of a "Recycling Demonstration Zone" for recycling enterprises in the Changpin Industrial Park (see article on page 8).

III. Revised Waste Disposal Act

Important measures in the revised *Waste Disposal Act* include: First, the establishment of emergency waste disposal mechanisms, second, the establishment of diversified industrial waste disposal methods and, thirdly, the implementation of management mechanisms for industrial waste (see article on page 3 for the content of these measures). In yet another big project, the EPA now plans to revise the related regulations of the *Waste Disposal Act* in order to implement new waste disposal measures. The EPA, as part of this effort, has thus far listed regulations to be augmented, revised, discarded or announced. There are a total of 40 regulations among these, including the *Waste Disposal Act Enforcement Rules* and the *Regulations Governing the Levying of General Waste Collection and Treatment Fees*.

Plan for the Establishment of Industrial Waste Final Disposal Sites

A shift is underway in Taiwan from sanitation landfills to incinerators. By next year (2002), after

In the past industrial waste was disposed of by either the producer itself, or by a local government sanitation crew or a contracting disposal firm, noted Director General Leu, and the use of contracting disposal firms was the most common. But due to the uneven quality of disposal firms and the country's overly strict licensing requirements, much industrial waste was not disposed of in an appropriate manner. After diversified disposal methods are established in line with the revised Act, as long as a disposal facility has been established by or under the guidance of the authorities in charge of the target industry, or by a state-run enterprise appointed by the central competent authorities, that facility may be hired to dispose of industrial waste. This diversification of disposal methods will help effectively resolve the country's industrial waste problem.

IV. The National Industrial Waste Management and Disposal Plan

Approved by the Executive Yuan on January 17 of this year, the *National Industrial Waste Management and Disposal Plan* puts the EPA in charge of planning, assigning duties, coordinating and implementing the disposal of ordinary industrial waste, and makes the Ministry of Economic Affairs (MOEA) responsible for the disposal of hazardous industrial waste and the establishment of disposal facilities. The plan's main goal is to strengthen the source management of industrial waste and track its flow, better grasp the quality and quantity of industrial waste and strengthen auditing and control of industrial waste. The EPA already completed a comprehensive quantitative/qualitative survey of industrial waste and forecasts of quantities of different types of waste generated in the next ten years. It is now requesting the competent authorities in charge of target enterprises to complete the establishment of emergency industrial waste storage facilities by December of this year.

In a few final remarks concerning the offshore disposal of waste, Director General Leu stated that while the EPA still prohibits the shipping of general waste to overseas disposal sites, firms in nations such as France (for PCB-containing waste) or the US (for hazardous sludge) may be commissioned to dispose of hazardous industrial waste that cannot be handled in Taiwan. This disposal must be conducted in accordance with the Basel Convention. In the future the EPA will work together with customs authorities to stamp out the illicit export of waste.

21 large waste incinerators have been completed and are operating, 5,600 kilotons of incinerator ash

will be generated every day, and this ash must be adequately disposed of. But since almost one-half (49.4%) of existing landfills will be full in less than two years, locally established landfills will be hard pressed to resolve the growing problem of incinerator ash. Moving to deal with this situation, the EPA has decided to commit close to NT\$6 billion in funds over the next three years to promote the construction of final disposal sites.

In accordance with the *National Industrial Waste Management and Disposal Plan*, the EPA has drafted the *Plan for Encouraging State-run and Private Enterprises to Construct and Operate Final Disposal Sites for General Industrial Waste (including Municipal Solid Waste Incinerator Ash) and the Plan for the Emergency Establishment of Final Disposal Sites for Industrial Waste (including Municipal Solid Waste Incinerator Ash)* (see EPM Vol. IV, Issues 4 and 7).

As the EPA continues to encourage state-run and private organizations to construct final disposal sites, these plans will target the 12 cities and counties that have already built incinerators, plus the other seven cities and counties that have proposed construction plans. Taichung, Hsinchu City, Tainan County, and Taipei County have proposed BOO plans, Taichung County and Chiayi County have proposed BOT plans, and Tainan City has proposed a publicly built and operated facility.

As required by the operating guidelines announced and implemented in September, local governments are encouraged to build waste disposal facilities via BOT and BOO approaches. In addition, the government should hire a technology consulting organization to perform preliminary planning and the

Special Demonstration Zone for Recycling to be Established

The EPA, as part of its efforts to further the development of a recycling-conscious society, has drawn up a plan for the establishment of a special demonstration zone for recycling enterprises. Under this plan, the government will provide various incentives aimed at, among other things, rectifying the current situation in which the majority of recycling enterprises operate on land that is not zoned for recycling operations. The EPA is preparing to submit this plan to the Executive Yuan for approval.

The EPA, aiming to further promote the sustainable use of resources in Taiwan, has formulated a plan for the establishment of a special demonstration zone for recycling enterprises. This plan, which is intended to coordinate with the implementation of the *Resource Recycling and Reuse Act*, will foster the development of the recycling industry and rectify the present situation in which the majority of

sponsoring local government must pledge guaranteed amounts of general waste (including sludge and nonflammable waste) and incinerator ash. In accordance with subsidy guidelines implemented on Oct. 4, 2001, the EPA shall subsidize the cost of disposing of guaranteed amounts of waste. Other regulations, including those governing hiring of contractors, are being revised in consultation with local environmental protection bureaus, and are expected to be completed in the very near future.

The EPA forecasts that general industrial waste final disposal sites with a total capacity of 7.16 million kilotons and waste incinerator ash landfills with a total capacity of 3.58 million kilotons will be completed by the end of 2003. The EPA is pleased that the passage of the revised Act has led to the diversification of industrial waste disposal mechanisms.

Turning to the *Plan for the Emergency Establishment of Final Disposal Sites for Industrial Waste*, although 13 final disposal sites have been constructed by state-run and private organizations, only six are still in operation, and these are insufficient to meet real needs. To shorten construction time, the EPA has joined forces with the MOEA and the Taiwan Sugar Corporation to jointly implement this plan (see EPM Vol. IV, Issue 7). Taiwan Sugar Corporation is currently carrying out planning and EIA work, and the EPA and Taiwan Sugar are taking active steps to reach out to and explain their plans to citizens living in the vicinity of planned sites. According to this plan, the EPA will complete 60 hectares of final disposal sites for general industrial waste during the first stage (to December 2002) and add another 90 hectares during the second stage.

recycling enterprises operate illegally on land that is not zoned for recycling work. This plan will also help change the waste management practices of the past and promote the rise of a recycling society.

The EPA's draft of the *Demonstration Recycling Zone Promotion Plan* (資源回收示範示範專業區推動計畫) calls for the establishment of a special zone of approximately 100 hectares for exclusive use by three types of recycling enterprises: those handling recyclable materials, those handling reusable materials and waste handling enterprises. The government will provide operational, financial and legal assistance to enterprises in this zone. Specific measures include support through land lease subsidies and technological assistance and the simplification of application procedures.

The EPA estimates that, under current market conditions in which the average price of leasing one square meter of land in an industrial park runs at around NT\$ 400 per year, leasing a 100-hectare piece of land would cost approximately NT\$ 400 million annually. The plan calls for providing lease subsidies for 10 years, with subsidies covering 50% of the lease cost in the first year and then being reduced gradually to 5% by the tenth year. The EPA expects these subsidies to require a budget of approximately NT\$ 1.1 billion over the ten years. The EPA will first rely on the Resource Recycling Management Fund for these expenses and intends to gradually increase annual allocations from government budgets to make up for the amount the Fund is unable to cover.

In the first stage of this plan, a demonstration recycling zone will be established at the Changpin Industrial Park. A piece of Taiwan Sugar Corporation land near the final waste disposal site in Tacheng Township, Changhua County, has been selected as an alternative site for the establishment of this first zone. Emulating successful overseas programs, the EPA plans to either establish a non-profit center for

the promotion of recycling zones or entrust the promotion of these zones to an existing organization such as the Industrial Technology Research Institute.

On another front, the EPA expects the establishment of this demonstration recycling zone to help rectify the current situation in which the majority of the over 400 recycling enterprises registered with the EPA are using land not authorized for recycling operations. The EPA believes that recycling zones will also facilitate the growth of the environmental protection industry and improve environmental management by handling waste at centralized locations. The EPA stresses that, while past environmental policies tended to focus predominantly on environmental supervision and pollution control, there are in fact enormous business opportunities in the environmental protection industry, making this industry a powerful tool for stimulating economic development. The EPA will present this plan to the Executive Yuan for approval after first consulting with all relevant government agencies. The EPA will implement this plan as soon as it receives approval. ▲

Three-stage Phase-out of Plastic Bags to Kick off in May 2002

Taiwanese consumers use over 10 billion plastic bags every year. These bags, being non-biodegradable, inflict serious damage on Taiwan's environment, a problem further compounded by the absence of plastic bag recycling channels. Addressing this situation, the EPA has formulated the Three-stage Timetable for Restricting the Use of Plastic Shopping Bags, which will commence the phasing out of plastic bags in May 2002.

EPA statistics reveal that Taiwanese consumers use roughly 270,000 kilotons of plastic bags (160,000 kilotons) and plastic film (110,000 kilotons) every year and that they use over 10 billion plastic bags annually. The types of retail outlets handing out the greatest number of plastic shopping bags are: mega stores (7.7 million bags), franchised convenience stores (5.4 million), supermarkets (2.5 million), department stores (680,000) and food vendors (240,000). What's more, the greater part of these bags is thrown out after being used just once.

Due to the non-biodegradable nature of plastic bags, this excessive consumption means that landfills will be choked with plastic bags for years to come. On the other hand, incinerating these bags causes heat values at incinerators to exceed those at which they are designed to operate and the inappropriate operation of incinerators while burning plastic bags is highly likely to generate dioxin emissions. Plastic bag litter can even become lodged in drainage systems and cause flooding. Compounding these problems, Taiwan has yet to develop a

public consciousness concerning the separation of plastic bags for recycling and also has yet to establish channels for recycling plastic bags. This means there are no avenues for recycling plastic bags.

Faced with the above problems, the EPA has decided after much consideration that the best way to reduce the damage caused by plastic bags to the environment is to limit their usage starting at the source. This decision has led to the formulation of the Three-stage Timetable for Restricting the Use of Plastic Shopping Bags (購物用塑膠袋三階段禁用時程表). The EPA is set to kick off this plan in May 2002.

In the first stage, scheduled to commence in May 2002, shops at government agencies, schools and military installations will be prohibited from providing plastic bags. In the second stage, to start in November 2002, retail stores of a yet to be determined size will be banned from providing plastic bags. In the third stage, set to begin in November 2003, bakeries, laundromats and retail stores that do not fall into the category targeted in stage two will be prohibited from providing plastic bags. However, aiming to meet the realistic needs of consumers, these prohibitions will not apply to the purchase of fresh meat, fish or produce or hot food.

Taking its lead from similar programs in other countries, the EPA will impose fines in order to insure that organizations and enterprises comply thoroughly with these regulations. For example, gen-

eral retail stores, department stores and supermarkets with floor space of over ten ping (one ping is nearly equal to 36 square feet) will be prohibited from providing customers with free shopping bags, either plastic or paper, under this program. First time offenders will be granted a three-month probation period, while second time offenders will be required to pay a fine of NT\$ 70,000 to NT\$ 700,000 depending on how many ping their stores cover.

As the vast majority of plastic shopping bags in Taiwan are manufactured from polyethylene (PE), this program is likely to impact the operations of PE producers. Therefore, the EPA invited plastics manufacturers, plastic goods manufacturers, department stores and environmental groups to participate in a forum addressing this plastic bag source reduc-

tion policy on October 16. Although manufacturers have continued to call for a postponement of this plan, the EPA has made clear its resolve in putting this policy into action.

The passage of revisions to the *Waste Disposal Act* by the Legislative Yuan creates an even stronger legal basis for these bans on the use of plastic bags. The EPA looks forward to the cooperation of enterprises in implementing this plan. It is also calling on the citizens of Taiwan to cherish the earth's limited resources and to develop the habit of reusing plastic bags and of carrying their own shopping bags. This cooperation between the government, enterprises and the public will foster the development of a recycling-conscious society in Taiwan. ♻

Waste Top Grievance Among over 100,000 Environmental Complaints

EPA statistics reveal that the nation's environmental authorities received a total of 102,200 environmental complaints in 2000. Of these, complaints about waste and environmental sanitation accounted for the largest number—32,875 (32.17%). The second-largest category consisted of noise pollution complaints (26,158; 25.59%); the EPA has decided to revise laws to facilitate resolution of noise pollution incidents.

The EPA announced the *2000 White Paper on the Handling of Environmental Complaints* on October 9th. This white paper explains the EPA's policies for dealing with environmental complaints and analyzes complaint statistics. A total of 102,200 complaints were accepted by environmental authorities in 2000; this works out to an average of 46 complaints for every 10,000 persons in Taiwan, or one complaint every 5.1 minutes.

The EPA's analysis classifies environmental complaints according to type of pollution. Waste and environmental sanitation was the largest category on the basis of its 32,875 complaints (32.17%), and waste-related complaints predominated in all of Taiwan's 14 cities and counties. This shows that waste and environmental sanitation is the environmental problem eliciting the most universal concern among the general public. In the waste subcategory, the dumping of refuse in public areas and the dumping of abandoned vehicles were the most common problems. As for general environmental sanitation complaints, the most common problems were pollution from poultry and livestock, vehicular pollution and the catching of stray dogs, in that order.

Noise pollution complaints, the second-largest category, numbered 26,158 (25.59%). Foul odors, with 24,087 complaints (23.57%), was the third-largest category. Taken together, noise and foul

odors thus accounted for 49% of all environmental complaints. Since foul odors and noise pollution incidents occur at indefinite times, and also involve sensory perception, it can be difficult to confirm violations. Progress in stamping out these forms of pollution has thus fallen far short of the public's expectations, causing widespread dissatisfaction. The EPA has therefore decided to strengthen control of "disturbing noise" and "adjacent noise" in the new *Noise Control Standards for Public or Private Facilities* (公私場所噪音管制標準); these standards will be applicable to public or private persons or facilities that may produce noise. Air pollution complaints (not including foul odors), which numbered 11,091 (10.85%), constituted the fourth-largest category. Water pollution complaints numbered 7,498 (7.3%) and constituted the fifth-largest category. Due to the rapid growth in foul odor and waste problems (including general environmental sanitation problems), efforts must be taken in the future to stop them from eroding the quality of life.

Statistics on pollution sources reveal that industry was the largest source, and accounted for 27.59% of all pollution incidents in 2000. General residential pollution (25.6%) and commercial pollution (16.61%) were respectively in second and third place. While industrial pollution problems have again jumped ahead of general residential pollution problems, the two are still roughly equal in importance. This indicates that as the members of the public demand an increasingly high quality of life, they are less willing to put up with pollution from their neighbors. This situation has prompted environmental authorities to simultaneously impose strict controls on both industrial pollution sources and the polluting activities of the general public.

By geographical area, Taipei City accounted for the greatest number of pollution complaints—24,485 (23.96%)—and was followed by Taipei County with 14,629 complaints (14.31%). The Greater Taipei region therefore accounts for 38.27% of all environmental complaints. Changhua County was third with 7,679 complaints, Taoyuan County was in fourth with 6,024 complaints and Kaohsiung was fifth with 5,895 complaints. These statistics tell us that pollution incidents are most common in urban areas with a high population density.

The environmental problems that elicited the most public concern in industrialized cities and counties were waste gases and foul odors from factories, wastewater effluent from enterprises, random dumping and burning in stagnant air conditions. The

Guidelines for Toxic Chemical Emergency Plans Simplified

The EPA's new *Guidelines for Class Three Toxic Chemical Substance Hazard Prevention and Response Plans* reduces the classes of toxic chemicals for which prevention and response plans must be submitted to only Class III toxic chemicals. Information which must be reported in these plans includes MSDS (Material Safety Data Sheets), hazard prevention plans and emergency response plans. In addition, these new guidelines simply require that operators include the location where these plans will be openly provided to the public among the submitted documents instead of requiring that they request approval of this location from local environmental protection agencies.

The EPA promulgated the *Toxic Chemical Substance Hazard Prevention and Response Guidelines* (毒性化學物質危害預防及應變作業要點) in 1998 in order to diminish the chances of toxic chemical substance accidents and improve emergency response capabilities. These guidelines required that enterprises using any regulated toxic

problems that drew the most concern in urban areas were urban noise, construction noise and vibrations, smoke from restaurant stove hoods and busses, motorcycle exhaust and waste gases. The main problems in ordinary cities and counties were random dumping and burning in stagnant air conditions, open-air burning and livestock and poultry odors. These results were generally consistent with the distribution of complaints.

The EPA asserts that it will continue to strive for the improvement of its handling of environmental complaints. The public can use the EPA's 24-hour environmental complaint hotline (0800-066666), e-mail, letters, or deliver their complaints in person. The EPA guarantees absolute confidentiality. ♻

chemical substance submit prevention and response plans to local environmental protection agencies and insure that these plans are provided openly to the public. Now, following nearly three years of implementation, the EPA has recently devised its new *Guidelines for Class Three Toxic Chemical Substance Hazard Prevention and Response Plans* (第三類毒性化學物質危害預防及應變計畫作業要點) in order to replace the original guidelines with more simple guidelines.

Among the most significant changes in these new guidelines is that prevention and response plans are no longer required for Class I, Class II and Class IV toxic chemical substances; these plans are now only needed for Class III toxic chemical substances. Also, different regulatory standards based on the chemical state and volume of Class III toxic chemical substances have been established (see chart below).

Standards for the Submission of Toxicology Information and Emergency Response Plans for Class III Toxic Chemicals	
Chemical State	Minimum Regulated Volumes; Information and plans must be submitted when:
Gas	for any single substance, at any single location, at any single time, the total operating volume meets or exceeds the minimum regulated volume.*
Liquid	for any single substance, at any single location, the total annual volume meets or exceeds 300 kilotons or the total volume at any single time meets or exceeds 10 kilotons.
Solid	for any single substance, at any single location, the total annual volume meets or exceeds 1200 kilotons or the total volume at any single time meets or exceeds 40 kilotons.
* For chlorine or formaldehyde, operators are not subject to this requirement when, for any single substance, at any single location, at any single time, the total operating volume does not reach 2 kilotons.	

Documents required under these new guidelines include MSDS (Material Safety Data Sheets), hazard prevention plans and emergency response plans. These documents must be drawn up in triplicate, with one copy being held by the operator and two copies being sent to local environmental agencies.

The new guidelines require that operators simply list the location at which submitted information

will be openly provided to the public in their prevention and response plans; operators are no longer required to seek approval for this location from local environmental authorities. Also, operators who operate within the new standards for Class III toxic chemical substances and who submitted the required documents before the new guidelines were announced will not be required to resubmit documents.

News Briefs**Trial Plastic Bag Restrictions to be Imposed First in Urban Areas**

When EPA Administrator Dr. Lung-Bin Hau on October 8 called on Taipei Mayor Ma Ying-Jeou (馬英九) to enlist the Taipei City government's support for the EPA's policy of restricting the use of plastic bags, he received Mayor Ma's backing on the spot. Administrator Hau stated after the meeting that the EPA's restrictions on plastic bags and disposable tableware would be implemented within nine months at the latest. The EPA looks forward to speeding up implementation after the passage of the revised *Waste Disposal Act*, and hopes to first implement use restrictions on a trial basis in Taiwan's primary urban centers Taipei City and Kaohsiung City.

"Re-enactment" of Noise Added to Noise Controls

Satisfaction with the response to noise complaints has always been very low. The main reason for this is that while noise is occurring when the complaints are made, the noise has often temporarily ceased by the time investigative personnel have arrived. Since the investigators cannot wait indefinitely for the noise to recur, they are forced to close the case with the remark "noise source not discovered." It is only natural that this leads to public grumbling. The EPA has therefore added "When a noise source is intermittent, or when a process is suspected of producing noise, [investigators] may order the operation of all equipment" to the revised draft *Noise Pollution Control Act* (噪音管制法), now in deliberation. This means that investigative personnel will have the right to request operators to turn on or start up noise-producing equipment to "re-enact" a noise incident, giving the personnel an opportunity to measure noise levels.

Administrator Hau Communicates with Local Residents about Waste Disposal Facility

EPA Administrator Dr. Lung-Bin Hau visited Tacheng Township, Changhua County, on the after-

ing the demonstration recycling zone and general industrial waste final disposal site that the EPA and Ministry of Economic Affairs preliminarily plan for the township. Administrator Hau affirmed that the EPA is committed to dialog with the public, and will not begin the project in question until after an EIA has been completed and public views are understood.

EPA Holds Oil Pollution Emergency Exercise

The 2001 "Large-scale Marine Oil Pollution Emergency Response Exercise" was held on October 23rd in Taipei Harbor with the assistance of the Keelung Harbor Bureau. This exercise consisted of the emergency response to a simulated Grade 3 oil pollution incident involving an oil tanker. The content of the exercise included notification procedures and real-time onsite response measures. The EPA used this exercise to discover problems, make immediate improvements, and strengthen vertical and horizontal liaison with the participating units, facilitating the establishment of an emergency response system.

Modification of EIA Scope Determination Standards

The EPA announced the revised *Standards for Determining Detailed Items and Scope of Environmental Impact Assessments for Development Activities* (開發行為應實施環境影響評估細目及範圍認定標準) on October 3rd. Reflecting the resolutions of the Economic Development Advisory Committee, some articles have been revised to simplify EIA procedures and appropriately ease restrictions on area of development. Newly-added Article 31-1 specifies that when total pollution emissions do not exceed the values on an original, approved EIA, and the various development activities have received the approval of the competent authorities and authorities in charge of the target enterprise, an EIA in accordance with articles 3~31 is not required. The organization in charge of managing the development activities must, however, report annually to the local competent authorities concerning the state of implementation of total quantity controls (TQC).

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