



Water Quality

Introducing the EPA's Soil and Groundwater Pollution Remediation Fund Management Committee

Established in October of 2001, the Soil and Groundwater Pollution Remediation Fund Management Committee has now been operating for a full year. During this period the management committee has gradually implemented its various tasks, which include the collection of remediation fees, investigation of suspected contamination sites and formulation of relevant regulations, and its impact on industry and the public is increasing steadily. This issue will explain the management committee's operational approach and future areas of focus.

The first legislative steps to protect soil and groundwater in Taiwan began in 1991, when the EPA completed the draft *Soil Pollution Prevention Act* (土壤污染防治法) and submitted it to the Legislative Yuan for deliberation. But due to a series of major soil pollution incidents over the next few years, it was eventually found that the content of the original draft was not adequate to meet the country's real needs, and the bill was withdrawn from the Legislative Yuan in 1996. The EPA completed a revised *Soil Pollution Prevention Act* in 1998, which was renamed the *Soil Pollution Remediation Act* after being deliberated by the Executive Yuan. This bill was submitted to the Legislative Yuan in 1997. Legislators took strong interest in the bill during the period of deliberation, and drew up the *Soil and Groundwater Pollution Remediation Act* (土壤及地下水污染整治法) for review together with the *Soil Pollution Remediation Act*. After review by a joint conference of the Legislative Yuan, it was confirmed that groundwater pollution problems must be incorporated within the bill and dealt with in a comprehensive manner. The name of the bill was changed to the *Soil and*

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President Chen Shui-bian (center) commends students for their environmental protection achievements.

President Commends Environmentally-Active Schools, Teachers and Students

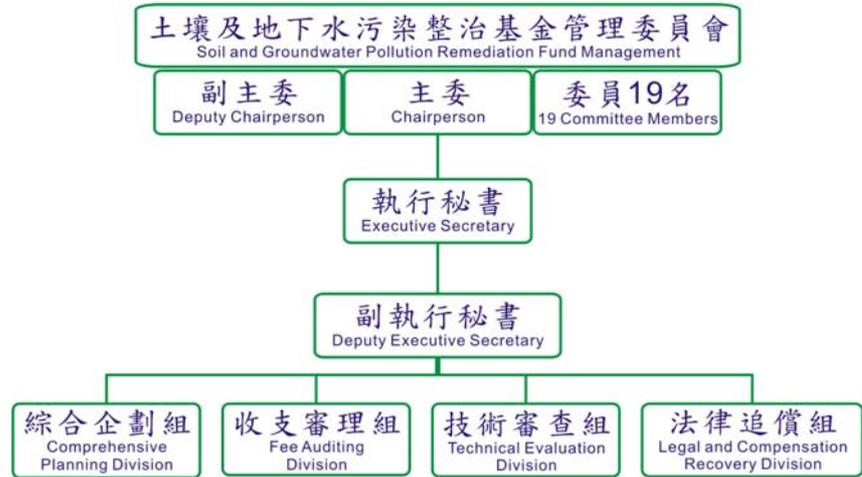
President Chen Shui-bian (陳水扁) commended schools, teachers and students that have actively promoted environmental protection during 2002 at a reception held on September 19. President Chen praised those individuals whose everyday enthusiasm for environmental protection has achieved exceptional results. A total of 25 students, 33 teachers and 30 schools at all levels were honored for their active support of environmental protection at this reception.

Groundwater Pollution Remediation Act (SGPRA). After passing review on January 13, 2000, the SGPRA was formally enacted by the president on February 2 of the same year. This event was the most significant milestone to date in the country's soil and groundwater remediation efforts.

Achieving the Most Possible with Limited Manpower

Authorized in accordance with Article 24 of the SGPRA, the EPA promulgated the *Organizational Rules of the Soil and Groundwater Pollution Remediation Fund Management Committee* (土壤及地下水污染整治基金管理委員會組織規程) in July 2001 to clearly define the duties and authority of the Soil and Groundwater Pollution Remediation Fund Management Committee (abbreviated as the "SGPRFMC" below). The EPA formally established the SGPRFMC in October of the same year, with EPA Administrator Hau Lung-bin (郝龍斌) as its chairman, EPA Deputy Administrator Chang Tzu-en (張組恩) as its vice chairman, and government agency delegates, industry group representatives, experts and specialists, and impartial public figures making up the remainder of its 21 members. The three SGPRFMC conferences held to date conducted far-ranging discussions of such issues as the SGPRFMC's service policies, legal problems connected with relevant regulations and the use of remediation fees. The results of these discussions have provided the EPA with important guidance for the drafting of policies.

The SGPRFMC has established the post of executive secretary to bear responsibility for implementing relevant tasks. This post has been filled by Chen Hsien-heng (陳咸亨), who is concurrently deputy head of the EPA's Bureau



of Environmental Inspection. In accordance with the organizational regulations of the SGPRFMC, beneath the executive secretary are a deputy executive secretary, a Comprehensive Planning Division, a Fee Auditing Division, a Technical Evaluation Division, and a Legal and Compensation Recovery Division. These divisions are responsible for the following duties.

- Comprehensive Planning Division: Drafting of the SGPRFMC's annual work plan and work items
- Fee Auditing Division: Audit of collected remediation fees and expenditures
- Technical Evaluation Division: Evaluation and grading of contamination sites, implementation of pollution survey projects and other technical tasks
- Legal and Compensation Recovery Division: Legal interpretation of SGPRA; pursuit of remediation fees

The largest problem currently facing the SGPRFMC is a severe lack of manpower. Charged with the mission of resolving complex and daunting soil and groundwater pollution issues, each of the SGPRFMC's divisions must rely on the assistance of draft-age young men who have volunteered for environmental protection duties

as an alternative to military service. The SGPRFMC plans to resolve the problem of insufficient manpower by recruiting and hiring its own personnel in the future. It will also hire a technical consulting organization to provide soil and groundwater pollution consulting and additional personnel services.

The problem of insufficient manpower is even more severe at the local government level. The SGPRA stipulates that city and county governments shall serve as the main implementing party responsible for the control of contamination sites, but many city and county environmental protection bureaus lack dedicated units, and in fact can assign only a single person to perform relevant tasks. Since the remediation of contamination sites frequently requires coordination with the local agriculture bureau, construction bureau or other agency, it is typically a complex task that cannot be attempted using such insufficient manpower. One of the SGPRFMC's most pressing future goals is thus to strengthen the implementation ability of local governments.

Investigating Suspected Contamination Sites

The collection of remediation fees formally began in November of last year. Although it was originally expected that more than NT\$1.36

billion in income would be collected in 2002, the EPA decided to lower the fee rate to 45% in light of various objective factors. Estimated fee income for the year has likewise been revised downward to NT\$750 million. Fees are being charged for 126 chemical substances in six categories. These categories are petroleum-related organic chemicals, chlorine-containing hydrocarbons, non-petroleum-related organic chemicals, pesticides, heavy metals and their compounds, and one category for other chemical substances.

The remediation fund provides stable support for investigative work. The SGPRFMC performed large-scale investigations of 319 hectares of agricultural land suspected of being contaminated with heavy metals, 19 filling stations suspected of being severely polluted and six large petrochemical storage tanks during the past year. The SGPRFMC also performed in-depth investigations of suspected pollution cases brought to its attention by the public. The total of 21 control sites that have been confirmed and announced to date include seven pieces of agricultural land, six filling stations, five oil storage tanks, two industrial sites and one illegal dumping site.

Strengthening Implementation of Remediation Work

After having gained a year of experience, the SGPRFMC plans to emphasize the following tasks in the future:

1. Active promotion of relevant legal drafting work: The formulation of the draft *Regulations for the Preliminary Assessment of Control Sites* (控制場址初步評估方法) and other related regulations has not been completed, but these regulations and relevant administrative guidelines must be implemented

as soon as possible if remediation work is to proceed successfully.

2. Strengthening of policy awareness and personnel training: More education and awareness concerning fee payment and reporting procedures will be aimed at the targets of pollution remediation fees. To strengthen basic-level law enforcement capability, environmental authorities at all levels will be helped to improve education and training concerning SGPRFMC regulations and remediation and investigative techniques. The SGPRFMC will also continue to perform policy research in an effort to enhance acquisition and sharing of the most up-to-date pollution remediation technology.
3. Ongoing investigation of suspected contamination sites and establishment of a groundwater pollution prevention information system: The SGPRFMC has begun remediation of agricultural land found to be contaminated with heavy metals. It is also investigating the status and extent of groundwater pollution at 20 illegal dumping sites around Taiwan that have been placed under regulatory control, and will be devising response measures in line with the results of these investigations. In addition, it has strengthened understanding of groundwater pollution by collecting extensive groundwater quality monitoring data and expanding its "groundwater quality monitoring and pollution control information system."
4. Establishment of a site emergency response system: To deal with the problem of pollution of agricultural land used to grow edible crops, the SGPRFMC must strengthen cooperation with agricultural authorities and establish an interagency pollution incident notification system

and lateral tracking and cleanup mechanisms. With regard to groundwater pollution incidents, the SGPRFMC will establish an emergency response mechanism and oversee the implementation of emergency response work by local governments, while providing necessary administrative assistance and funding support.

5. Ongoing control of contamination sites: The SGPRFMC will oversee and assist local governments in verifying, announcing, placing under regulatory control, controlling and remediating contamination sites.
6. Establishment of pollution remediation information website: The SGPRFMC will establish a soil and groundwater pollution remediation information website. This website will explain relevant laws, provide information on contamination sites, post up-to-date news concerning the SGPRFMC and provide information about remediation developments in Taiwan and other countries. It will provide an overview of policy implementation results and promote interaction between the EPA and the public.

Pollution Survey of Old Filling Stations and Storage Tanks

After performing groundwater pollution surveys of 191 filling stations and 21 large petrochemical storage tanks nationwide in 2001, the EPA has confirmed and announced that four filling stations and four large petrochemical storage tanks have been listed as pollution control sites. To tighten control of filling stations and large petrochemical storage tanks, the EPA expanded the scope of its investigative efforts and carried out the National Pollution Hazard Survey of Large Storage Tanks and Filling Stations more than Ten Years Old

this year. It also launched full-scale groundwater pollution surveys of 2,062 large petrochemical storage tanks with a capacity in excess of 100 kiloliters.

In connection with old filling stations, the EPA will measure the LEL (Lower Explosive Limit) and VOC values of filling station leak detection tubes, identify filling stations likely to be polluted, and sample and analyze soil gas and gasoline vapor from leak detection tubes. After results of analysis are used to ascertain the filling stations with the highest pollution hazard, soil and groundwater sampling will be performed, the filling stations assessed and listed as polluted sites when necessary, leak surveys performed, and control plans and emergency response measures formulated.

Survey procedures for large storage tanks are similar to those for filling stations. After soil gas sampling and analysis is performed, soil and groundwater pollution surveys will be implemented for those tanks determined to have a high pollution hazard. The soil and groundwater pollution analysis of large storage tanks will address the items of the substances currently and previously stored in the tank, organic compounds and their possible derivatives, organic compounds listed in soil and groundwater control standards, aromatic hydrocarbons and chlorine-containing hydrocarbons.

The EPA also plans to compile soil and groundwater survey data and establish a database to guide subsequent tracking and control efforts. It is expected that emergency response measures will be performed at approximately 100 sites under this plan. Necessary emergency response measures will be undertaken whenever soil and groundwater pollution is discovered during the survey process, and efforts will be made to track down the sources of

pollution. When necessary, monitoring wells will be established and soil gas, soil and groundwater sampling and analysis, tank capacity analysis, electrical connectivity testing, electrical leakage testing, anti-corrosion electrical potential testing and other analysis and testing performed.

The EPA hopes that survey work performed under this plan will enable it to keep better tabs on pollution from filling stations and large petrochemical storage tanks throughout Taiwan, and will provide information to guide response measures needed to prevent the spread of pollution. The EPA will employ its findings to perform remediation work required to ensure the safety of groundwater resources.

The complexity of soil and groundwater pollution problems usually means that remediation work is extremely costly. Since soil and groundwater pollution remediation work in Taiwan is still at an embryonic stage compared with that in Europe, the US and Japan, the country still faces the challenges of absorbing foreign remediation experience, acquiring the most up-to-date remediation technologies and methods, and developing workable, pragmatic contamination site remediation models.

For more information, please call 02-2311-7722 ext. 2279.

Air Quality

EPA to Assume Control over Ozone Depleting Substances

Article 30 of the revised *Air Pollution Control Act* enacted in June of this year authorizes the EPA to control air pollutants made subject to regulatory control by international environmental protection conventions. While ozone depleting substances (ODS) had previously been controlled via executive orders from various agencies, the EPA has now been made the competent authority in charge of this task.

Taiwan is not a signatory to the Montreal Protocol. However, to fulfill its responsibility as a member of the international community, the government organized an inter-agency task force in 1989 to coordinate compliance with the requirements of this protocol. In addition, the government also accepted the consumption reduction timetable devised for developed nations and assigned control duties to various relevant agencies. The import and production of CFCs is completely prohibited in Taiwan. According to the current assign-

Consumption of HCFCs in Taiwan (metric tons of ODP)

	1996	1997	1998	1999	2000	2001
HCFC-22	300.08	264.88	290.785	220.88	274.505	325.435
HCFC-141b	318.78	267.63	234.63	280.5	227.48	184.36
HCFC-142b	6.5	-0.845	5.07	4.355	1.69	3.185
HCFC-123	2.06	2.3	1.92	3.1	3.36	3.34
HCFC-124	0.462	0.242	0.22	0.22	0.264	0
HCFC-225ca/cb	1.7	2.5	3.2	2.725	1.475	0.325
Total	629.582	536.707	535.825	511.78	508.774	516.645

Note: Taiwan's standard HCFC consumption is 638.156 metric tons of ODP.

ment of responsibilities, consumption of HCFCs and methyl bromide is controlled by the Industrial Development Bureau, an agency under the Ministry of Economic Affairs (MOEA), and the Council of Agriculture (COA) respectively.

The MOEA began controlling the consumption (production, import/export and consumption) of HCFCs in 1996, and currently oversees approximately 150 manufacturers, importers and users employing HCFCs as refrigerants, cleaners and foaming agents, etc. The nation's control targets call for consumption drops of 35% by 2004 and of 65% by 2010.

The COA began controlling consumption of methyl bromide in 1994, and currently oversees importers and users employing this substance as a pesticide and fumigating agent. The nation's control targets call for an end to the use of methyl bromide in pesticides by 2003, and will simultaneously eliminate the import quota for applications apart from use as a "fumigating agent and pre-shipment treatment agent."

Article 30 of the revised *Air Pollution Control Act* enacted in June of this year authorizes the EPA to control air pollutants made subject to regulatory control by international environmental protection conventions. The EPA is currently performing coordination tasks with the other relevant agencies, and expects to assume unified control over approval and allocation of HCFCs and methyl bromide starting some time in the middle of 2003.

For more information, please call 02-2311-7722 ext. 2668.

Draft Strengthens Standards for the Underground Injection of Post-treatment Wastewater

In coordination with revisions to the *Water Pollution Control Act* in May, the EPA announced its draft of revisions to *Water Quality Standards for the Underground Injection of Post-treatment Wastewater* (污水經處理後注入地下水體水質標準) on September 16. By announcing this draft, the EPA hopes to receive feedback from the public concerning these revisions. These revisions divide target substances into "substances harmful to human health" and general controlled items. Also, because underground bodies of water have a relatively low ability to cleanse themselves, this draft strengthens controls for such substances as chromium, selenium, arsenic and ammonia nitrogen by putting them in line with drinking water standards.

Draft Water Quality Standards for the Underground Injection of Post-treatment Wastewater

General Controlled items

Item	Limit	Item	Limit
1,1,1-trichloroethane	0.2	Vinyl chloride (chloroethylene)	0.002
1,1-dichloroethylene	0.007	Chloride	250
1,2-dichloroethane	0.005	p-dichlorobenzene	0.075
Trichloroethylene	0.005	Zinc	5
Coliform group	50	Barium	1
Carbon tetrachloride	0.005	Manganese	0.05
Biological oxygen demand (BOD)	1	Total trihalomethanes	0.15
Nitrite nitrogen	ND	Total dissolved solids	800
Benzene	0.005	MBAS	0.5
Ammonia nitrogen	0.1	Suspended solids	25
Sulfate	250	Iron	0.3
Phenols	0.001	pH value	6.5~8.5

Substances Harmful to Human Health

Item	Limit	Item	Limit
Nitrate nitrogen	10	Total organic phosphate	0.05
Fluoride (not including complex ions)	0.8	Total carbonate	0.05
Cyanide compound	0.01	Herbicide	0.1
Silver	0.05	Endrin	0.0002
Cadmium	0.005	Lindane	0.004
Lead	0.05	Heptachlor	0.001
Total chromium	0.05	DDT and its derivatives	0.001
Hexavalent chromium	0.01	Aldrin and Dieldrin	0.003
Total mercury	0.002	Pentachlorophenol (PCP) and its salts	0.005
Organic mercury	ND	Toxaphene	0.005
Copper	1	Folpet	ND
Nickel	0.1	Captafol	ND
Selenium	0.01	Captan	ND
Arsenic	0.01	Endosulfan	0.003
Polychlorinated biphenyls	ND	Pentachloronitrobenzene	ND

Note: The limits for each of these items are maximum limits, except for pH value which is a range. ND means non-detect. Measurement units for the above substances and items are listed below.

1. pH value: no unit

2. Coliform group: colony forming units per 100 milliliters (CFU/100 mL) of sample water

3. All other substances and items: milligram/liter

Waste Management

Subsidies for Incinerator Ash Reuse and Disposal

The EPA will provide local governments with subsidies to be used to encourage private enterprises to establish final disposal sites for incinerator ash using BOO and BOT investment methods and to acquire ash reuse technology. These measures are aimed at ensuring incinerator ash is treated properly and at reducing the burden on Taiwan's final waste disposal sites.

Incineration is currently the primary municipal waste treatment method used in Taiwan. Taiwan's 17 major municipal waste incinerators produced over 774,000 metric tons of incinerator ash in 2001. A total of 32 incinerators will be operating by 2006, creating 1.81 million metric tons of ash per year. With this much ash, a substantial portion of Taiwan's landfill space will be consumed if it continues its present policy of sending incinerator ash to landfills. Incinerator ash reuse technology has reached maturity and there are many examples of ash reuse overseas. The need for landfills can be greatly reduced if bottom ash, which is considered nonhazardous and accounts for the largest portion of incinerator ash, can be reused.

In order to add regulations governing the reuse and final disposal of municipal waste incinerator ash, the EPA has broadened the existing *Guidelines for Encouraging Public and Private Enterprises to Construct and Operate Final Disposal Sites for General Industrial Waste* (鼓勵公民營機構興建營運一般事業廢棄物最終處置場作業要點). These

expanded regulations will allow local governments, based on their particular needs, to either jointly construct both ash reuse facilities and final disposal sites on their own, or to construct only final disposal sites and select existing ash reuse plants to convert ash into a useful material. For the establishment of final disposal sites and new ash reuse facilities, local governments will encourage private enterprises to adopt BOO (build-operate-own) or BOT (build-operate-transfer) investment methods, or will build and operate these sites and facilities themselves.

To provide greater incentives for private investment by reducing investment risks, the EPA will offer subsidies to local governments so as to guarantee post-incineration volumes and prices for incinerator ash treatment facilities. The EPA will guarantee a post-incineration volume equivalent to 20% of an incinerator's design capacity. This includes sewer sludge and noncombustible garbage (accounting for 5% of an incinerator's design capacity) and incinerator ash (accounting for 15% of an incinerator's design capacity). The EPA will provide subsidies in order to guarantee prices up to a maximum of NT\$1,000 for each metric ton of ash. These guaranteed volumes and prices will be provided for three years. These subsidies are expected to cost NT\$3.58 billion.

The EPA will also offer guaranteed volumes and prices for local governments that choose existing ash reuse plants. These guaranteed volumes will be set according to contracts between local governments and ash reuse plants. As for subsidies for guaranteed prices, the EPA will offer up to NT\$800 per metric ton to ash reuse plants.

To establish a legal basis for the reuse of incinerator ash, the EPA has also drafted *Municipal Waste Incinerator Bottom Ash Reuse*

Regulations (垃圾焚化廠焚化底灰再利用規定). The draft would require that TCLP testing be conducted one time for every 500 metric tons of bottom ash prior to reuse. Only when TCLP tests of this ash meet hazardous industrial waste standards would the ash be suitable for reuse. This draft would permit incinerator ash to be reused only as an aggregate in non-rebar concrete, asphalt concrete and bricks, as road base material, and as a substitute covering material for landfills.

Studies show that approximately 20 metric tons of steel and 3 metric tons of non-steel metals can be recovered from every 100 metric tons of municipal incinerator ash. There are also 53 metric tons of materials that can be reused as an aggregate in construction materials in each 100 metric tons of incinerator ash. With ash containing this much reusable material, the EPA has adopted an incinerator ash policy which grants priority to reuse and uses landfilling as a backup. This policy will not only reduce the demand for landfill space, it will also allow for the sustainable use of resources by promoting the recycling of valuable materials and reducing the wasteful use of resources.

For more information, please call 02-2370-5888 ext. 2648.

Recycling

New Standards for Recycling Methods and Facilities Drafted

In coordination with last year's revision of the *Waste Disposal Act*, the EPA has drafted revisions to the various method and facilities standards for the recycling, storage, clearance and dis-

posal of a number of waste items that are required to be recycled, including motor vehicles, tires, lubricating oil, lead acid batteries and dry cell batteries. These revisions provide specific standards for recycling enterprises to follow so as to prevent the creation of secondary pollution through the recycling process.

Article 18 of the *Waste Disposal Act* (廢棄物清理法) stipulates that the recycling, storage, clearance and disposal of recyclable items must comply with the regulations of the central competent authority and that the central competent authority is responsible for formulating the relevant method and facilities standards. As the central competent authority in this case, the EPA has formulated new drafts for many method and facilities standards.

These draft revisions state that the primary disposal methods for end-of-life motor vehicles should be dismantling and separation through crushing and shredding, unless the EPA designates otherwise. Dismantling plants should possess freon recovery equipment and freon storage tanks. Storage methods for gasoline, motor oil, tires and batteries recovered from end-of-life vehicles should comply with the relevant method and facilities standards for the recycling, clearance and disposal of recyclable items. Auto body parts recovered through dismantling are required to be crushed and shredded and then separated before they are sent to electric arc furnace steel smelters. By removing non-metals, this process can reduce the amount of dioxin produced through the smelting process. The recycling/reuse rate achieved by this separation process would not be permitted to be lower than 60%.

Under this draft, recyclers would be permitted to reuse waste tires



Recyclers must comply with the relevant method and facilities standards for the handling of waste items in order to prevent the creation of pollution.

in their original form. Those tire recyclers that use a breakdown method, should adopt shredding, pyrolysis and energy recovery as their primary recycling methods, unless the EPA designates otherwise. Waste tire recycling organizations legally established prior to the implementation of these draft standards would be required to fully comply with these standards by July 31, 2003.

These revisions state that the primary recycling methods to be adopted by waste lubricating oil recycling facilities should be use of waste oil as a raw material for oil refineries or for energy recovery, unless the EPA designates otherwise. Any waste resulting from the recycling of waste oil should be handled in accordance with the relevant industrial waste clearance and disposal regulations. Waste lubricating oil recycling and treatment organizations legally established prior to the implementation of these draft standards would be required to comply with these standards within one year of their implementation.

Under this draft, dismantling or shredding would be the first pro-

cess required in the recycling of lead acid batteries. Waste acid liquid should be treated by wastewater treatment facilities in order to comply with effluent standards. Waste lead from these batteries should be sent to lead smelters in order to recover lead for reuse. The recycling, storage, clearance and disposal of waste lead acid batteries should be conducted in line with lead poisoning prevention rules and related occupational safety regulations.

This draft would require waste dry cell batteries to be treated in accordance with the relevant industrial waste clearance and disposal regulations. Expect for those that have obtained a permit from the EPA, recyclers would not be permitted to directly incinerate or landfill dry cell batteries. Recyclers that ship waste dry cell batteries to other countries would be required to first receive the approval of the EPA and would be limited to shipping these batteries only to nations that are members of the OECD and possess proper treatment facilities.

For more information, please call 02-2370-5888 ext. 3319.

Shipping Industry Placed under Waste Disposal Act Control

To strengthen control over the flow of industrial waste, the EPA announced on September 19 that the jurisdiction of the *Waste Disposal Act* has been expanded to include ship cargo offloading contractors, shipping firms, shipment agents, port warehouse operators and the tourist and entertainment industry. These five industries have now been included among the specified industries listed in Article 2-1-2 of the *Waste Disposal Act*. Starting from the date of announcement, all waste produced by these industries must be disposed of in accordance with relevant industrial waste regulations.

Green Mark Standards for Plastic Food Wrap Passed

The EPA's Green Mark Review Committee recently passed Green Mark standards for food packaging film. These standards stipulate that food wraps applying for Green Mark certification may not contain chemicals such as chlorine, plasticizing agents or stabilizers. In addition, the wrap's cardboard spool and outer box must employ at least 50% recycled paper. Food wrap meeting Green Mark standards will not produce dioxin when burned, and will not release toxic substances such as dibutyl tin compounds when heated to high temperatures. The Green Mark standards thus benefit both consumers' health and the environment.

Environmental Analysis

Requirements for Environmental Analysis Laboratory Managers Raised

The EPA has completed its draft of revisions to *Management Regulations for Environmental Analysis and Testing Organizations*, raising the requirements for the qualifications of laboratory managers and designating laboratory

managers as analysis report signatories. Under this draft, revisions have also been made to Taiwan's laboratory management regulations so as to put them in line with ISO Guide 17025.

In coordination with revisions to the *Waste Disposal Act*, *Air Pollution Control Act*, *Water Pollution Control Act*, and *Toxic Substances Control Act*, the EPA has drafted revisions to *Management Regulations for Environmental Analysis and Testing Organizations* (環境檢驗測定機構管理辦法). Consistent with the revisions of these related environmental laws, these revisions reassign these regulations to a new mother law. Revisions have also been made to Taiwan's laboratory management regulations so as to put them in line with ISO Guide 17025.

Concerning qualifications for laboratory managers, these revisions raise the requirement for analysis experience in an area related to the type of analysis for which the laboratory is applying for a permit from three years or more to five years or more. These revisions require a signatory for all sampling and analysis reports released by the laboratory and designate the laboratory manager as the signatory. In the case that the laboratory wishes to add an additional signatory, this signatory's qualifications must be equivalent to or greater than those of the laboratory manager and must be approved by the central competent authority.

These revisions also make provisions aimed at ensuring the safety of on-site personnel and the quality of data when sampling industrial waste. With the implementation of these revisions, on-site quality assurance/quality control personnel, sampling personnel and health and safety personnel would all be re-

quired to receive classroom training of 40 hours or more and three days field training. Health and safety personnel would also be required to receive an additional eight hours of professional training based on the special characteristics of the sampling site.

To coordinate with the International Organization for Standardization's implementation of the ISO Guide 17025, the EPA intends to revise and implement *Basic Regulations for Quality Systems* (品質系統基本規範) at an appropriate time. Environmental analysis and testing organizations will be required to follow these revised regulations when drawing up their laboratory management manuals. While analysis and testing organizations are currently required to submit their financial reports and operational reports for the various categories of analysis they conduct on a monthly basis, these draft revisions would require them to submit these reports only once each quarter. Also, instead of requiring laboratories to submit their financial reports for the previous year every January, these revisions would have laboratories submit the previous year's quality control data report at that time.

To ensure the proper operation of laboratory quality systems, these revised management regulations would require laboratories, when moving to a different location, to reapply for evaluation before they would be permitted to resume operations. The EPA would also establish an evaluation and technology committee. On-site evaluation specialists would be appointed to this committee who would be responsible for reviewing the permit applications of laboratories. The EPA would prohibit those laboratories whose sampling technique evaluations or blind testing results did not meet standards three consecutive times from con-

ducting analysis or testing related to that particular analysis or testing category or item. Compared to current regulations which require a laboratory to halt related analysis and testing after they fail to meet standards two times, these revisions would allow laboratories a reasonable opportunity to improve and lighten any negative impact on their operations.

Analysis and testing organizations that obtain permits prior to the implementation of these revised management regulations must apply for permit extensions under these new regulations before their original permits expire. Laboratory managers at these organizations who have just three years or more analysis and testing experience will not be subject to the five-year experience requirement of the revised regulations. Also, laboratories would be required to revise their laboratory management manuals within one year after the EPA announces its new *Basic Regulations for Quality Systems*.

For more information, please call 03-491-5818.

Recycling

921 Earthquake Demolition Waste Recycling and Reuse

The 921 Earthquake destroyed tons of buildings which later needed to be demolished and rebuilt. The massive volume of demolition waste resulting from this reconstruction work has placed a heavy burden on the environment. In order to resolve this problem, the EPA has coordinated with the relevant agencies in order to separate and recycle this demolition waste. This waste

will be used in public infrastructure projects in central Taiwan, helping Taiwan achieve its goal of the sustainable use of resources.

On September 21, 1999, a major earthquake with a magnitude of 7.3 on the Richter Scale hit central Taiwan. In addition to causing heavy human casualties, the earthquake also destroyed over 100,000 buildings. The subsequent demolition of these buildings created more than 10 million cubic meters of demolition waste. In the initial stages of post-disaster reconstruction, this waste was placed at over 100 emergency storage sites on unused or low-lying land near the cities and villages victimized by the earthquake in order to reduce clearance costs and time.

To help local governments handle this demolition waste properly, the EPA, in addition to regularly conducting environmental monitoring of this waste in order to prevent any damage to the surrounding environment, has also conducted various studies of final disposal options for this waste. These studies reveal that approximately 98% of this demolition waste is composed of useful materials, including bricks and tiles, cement rubble, rocks and dirt, and rebar. This material can be used to make useful building material, such as recycled concrete aggregate, with adequate crushing and separation. Test results show that the physical composition of this waste meets government standards for public construction material.

The EPA has been actively coordinating its efforts with the relevant agencies since the earthquake occurred in 1999. Several earthquake demolition waste recycling and reuse projects have been initiated with the assistance of the Executive Yuan 921 Earthquake Reconstruction Committee. As a

result, the recycling of demolition waste into construction material has already been completed at nine storage sites. This work has not only produced around 1.46 million metric tons of recycled construction materials, it has also allowed 22 hectares of these storage sites to be restored to their original land value. This recycled construction material has been successfully used in public construction projects in disaster areas, such as the Wurih Interchange on National Highway No. Three, the stage-two expansion of the Taichung Harbor Export Processing Zone, the coastal land reclamation project at the Changpin Industrial Park, the access road for the High Speed Railway's Wurih Station and the construction of river levees by the Water Conservancy Agency.

The excessive excavation of Taiwan's natural gravel resources in the past has already created numerous soil conservation and ecological problems. These demolition waste reuse projects have succeeded in transforming seemingly valueless demolition waste into useful concrete aggregate and construction materials. In addition to resolving disaster waste handling problems, this plan has also reduced the consumption of natural gravel resources.

The EPA, stressing that the sustainable use of resources is not simply an academic research topic, points out that it has accumulated a great deal of practical experience in the process of implementing these projects. This includes the formulation of many methods and rules for the separation and use of demolition waste. The EPA will build on this experience through the continued promotion of this plan, bringing Taiwan closer to its goal of the sustainable use of resources.

For more information, please call 04-2252-1718.

Low-Pollution Fuel Injection Motorcycles Achieving Mainstream Status

To reduce air pollution caused by motorcycles, the EPA has helped domestic motorcycles manufacturers to develop low-pollution fuel injection engine motorcycles. After formally going on the market in May of this year, sales of these motorcycles gradually increased after several months of promotional activities. Some models of these new motorcycles have even replaced conventional carburetor motorcycles as the market leaders in their categories. To encourage the public to purchase these low-pollution motorcycles, anyone who turns in a motorcycle that left the plant before December 31, 1997 for recycling and purchases a new fuel injection motorcycle may obtain an NT\$4,000 subsidy from the EPA.

Marine Oil Pollution Response Drill Held off Penghu

The EPA and the Penghu County (澎湖縣) government held a marine oil pollution emergency response drill on September 11. Among the more than 20 organizations mobilized as part of this drill were the Penghu County government, EPA, Coast Guard Administration, National Sun Yat-sen University, Chinese Petroleum Corp. and the National Central University Center for Space and Remote Sensing Research. This was the first time the EPA has conducted an oil spill response drill in the seas near Penghu, and hopes that the exercise will strengthen coordination and liaison channels between different organizations and improve the country's ability to cleanup marine oil spills.

EPA Expands Scope of Controlled Recycling and Disposal Firms

To strengthen control over the waste recycling and disposal industries, the EPA announced on September 20 that the scope of waste recycling and disposal firms that must register with the competent authorities has been enlarged. Apart from those firms receiving EPA recycling fund subsidies, all firms engaged in the processing of recyclable waste, all storage sites covering land exceeding a certain spatial area and that are used by recycling firms and scrap motor vehicle dismantling and recycling firms, and waste lubricating oil recycling firms with registered capital above a certain amount must complete registration procedures before the given deadline, and must report recycling and disposal figures and state of relevant operations.

Spraying Training Given to Dengue Fever Control Personnel

To strengthen control of dengue fever in southern Taiwan, on September 10 the EPA gave disease vector spraying training to more than 130 environmental protection and public health personnel from Kaohsiung City, Kaohsiung County, and Pingtung County. Apart from providing instruction in the mixing, dilution and use of environmental agents, the training session also showed how to prepare spraying equipment and gave an on-site explanation of usage and precautions. It is hoped that this training helped front-line personnel understand the correct use of environmental agents, enabling them to better eliminate the mosquitoes that carry dengue fever.

Prefabricated Wastewater Treatment Systems for Buildings Require Approval

In accordance with Article 25 of the *Water Pollution Control Act* (水污染防治法), the EPA has drafted the *Management Regulations for Prefabricated Wastewater Treatment Systems for Buildings* (預鑄式建築物污水處理設施管理辦法). These regulations establish review, approval and registration procedures for prefabricated wastewater treatment systems that are installed in buildings. They are intended to improve the quality of wastewater treatment in buildings and lessen the environmental impact of household sewage in areas that still lack sewer systems.

Motor Vehicle Noise Controls Tightened to Meet EU Standards

The EPA formally announced the nation's phase 3 and 4 motor vehicle noise control standards on September 4. The revised standards fulfill promises made in bilateral agreements with the EU in connection with Taiwan's WTO membership by adopting EU noise control directives and accordingly revising domestic vehicle noise control standards. The Phase 3 standards, which will take effect on July 1, 2005, tighten existing standards by 3 dB. The Phase 4 standards, which will take effect on July 1, 2007 and tighten existing standards by 6 dB, are identical with the current EU standards. In conjunction with implementation of the new standards and harmonization with international regulations, the Bureau of Standards, Metrology and Inspection, MOEA, is revising noise testing methods to bring them in line with EU requirements at some point in the future.

Waste Management

Performance Indicators Formulated for Large-scale Incinerators

The EPA is formulating operational and management indicators so as to improve the management of Taiwan's large-scale incinerators. By converting the operational and business information of incinerators into objective and quantifiable indicators, the EPA aims to help local governments establish management models for the operation and supervision of these incinerators.

Taiwan's current waste management policy calls for incineration first and landfilling second. With the implementation of this policy, the construction of many large-scale incinerators is nearing completion. However, lacking sufficient personnel and experience, local environmental protection bureaus face many difficulties in effectively managing the operations of these large and complicated incinerators. Also, as different incinerators have different operational requirements, it is difficult to compare the operational performances of different incinerators simply by referring to their individual operational reports.

Aiming to rectify this situation, the EPA is in the process of devising a set of objective and quantifiable performance indicators for the operation and management of the nation's incinerators. Having completed the first stage of planning for these indicators, the EPA has established six first-level indicators. These first-level indicators are for incineration, energy efficiency, pollution prevention,

facility maintenance, plant management and administrative management. There are also various second-level indicators under each first-level indicator. Altogether there are 14 mandatory and 16 optional second-level indicators.

Second-level mandatory indicators, such as the incinerator temperature compliance rate indicator under the first-level indicator incineration, are those that all incinerators must include in their indicator sets. On the other hand, second-level optional indicators,

such as the active carbon consumption indicator under the first-level indicator pollution prevention, are those that each incinerator, after having held discussions with its local environmental protection bureau to determine indicator weightings based on its special characteristics, is free to choose among. However, each incinerator is required to adopt at least seven of these optional indicators. This means each incinerator will have at least 21 mandatory and optional second-level indicators in its indicator set. The data sources for

calculating performance indicators include each incinerator's incinerator design, monthly operational report, daily report, on-line CEMS data, operational data (including analysis data commissioned from outside organizations), data provided by local environmental protection bureaus and data provided by the EPA.

The EPA will implement this indicator system after completing related research and feasibility studies.

For more information, please call 02-2311-7722 ext. 2521.

Waste Management

68% of the Public Supports Restrictions on Plastic Bags

A survey conducted in August shows that 68% of the public supports the EPA's restrictions on plastic shopping bags which were just introduced on July 1. This survey also reveals that this policy has achieved a reduction of over 90% in the use of plastic shopping bags at the establishments targeted in the first stage of this policy.

The first stage of the EPA's restrictions on plastic shopping bags were introduced formally on July 1. Hoping to gain an understanding of the public's response to this policy, the EPA commissioned The Gallup Organization to conduct a public opinion survey in the middle of August. The EPA will use the results of this survey in the future implementation of this policy.

This Gallup poll indicates that 90.43% of Taiwanese are aware the government has introduced restrictions on plastic shopping bags. Up significantly from 77% in April, this level of awareness proves the

EPA's promotional campaign for this policy has achieved success. The survey also reveals that 28.38% of the public feels this policy has caused inconveniences in their daily lives since it was introduced. However, 66.54% of those polled said this policy has not affected them personally. The survey shows a 67.81% support level for this policy. While still quite high, this figure is far lower than the 86% support level in April and the 90% support level in November 2001. This appears to indicate that

Prior to the implementation of this policy, only 14.05% of the public would carry their own shopping bags regularly and 57.42% never carried their own shopping bags. However, with the introduction of this policy, 29.45% of Taiwanese now use their own bags while shopping and the percentage of people who have never toted their own shopping bags has dropped to 36.38%. Also, whereas only 15.54% occasionally carried their own shopping bags in the past, 24.31% do so now.

These targeted establishments used 68,178 plastic shopping bags per day prior to the implementation of this policy; this daily average fell by 98.1% to 1,018 bags following implementation.

public support declined due to inconveniences caused by the implementation of this policy.

In early September, the EPA conducted a survey of the effectiveness of the policy's implementa-



The EPA's promotional campaign for restrictions on plastic shopping bags and disposable dishes, which includes the poster above, has been a great success.

tion at 343 establishments, including 85 restaurants and 258 stores,

These surveys reveal that the first stage of the EPA's restrictions on

ping habits and begun to carry their own bags when they go out shopping. The second stage of restrictions on plastic shopping bags and plastic disposable dishes will take effect on January 1, 2003, bringing this policy to an even greater portion of the public. This policy is sure to succeed if it continues to spur real changes in the public's living habits.

Whereas only 15.54% occasionally carried their own shopping bags in the past, 24.31% do so now.

targeted in the first stage of these restrictions. This survey reveals that these targeted establishments used 68,178 plastic shopping bags (including those given free of charge to customers and those sold to costumers) per day prior to the implementation of this policy and that this daily average fell by 98.1% to 1,018 bags (consisting only of those sold to costumers) following implementation.

This survey also focused on how these establishments responded to the introduction of these plastic shopping bag restrictions. It shows that 67%, or 230, of these establishments chose to not provide any bags and to encourage their patrons to carry their own bags instead. As for the other targeted establishments surveyed, 26.5% (91 establishments) decided to provide free paper bags and containers or shopping bags made of other materials instead of plastic shopping bags, while just 6.5% (22 establishments) opted to sell shopping bags (including environmental shopping bags and plastic shopping bags with a thickness in compliance with regulations).

plastic bags has succeeded in lowering the use of plastic bags by targeted establishments. Many citizens have also changed their shop-

Conference on the National Sustainable Development Action Plan

In order to solicit a broad range of views, the National Council for Sustainable Development (NCSA) invited more than 200 experts and specialists to the Executive Yuan National Sustainable Development Action Plan Conference it held on September 12. The conference, which was chaired by Minister of State Yeh Chun-jung (葉俊榮), began with briefings on the action plans drafted by the NCSA's various work groups. The participating experts and specialists then presented their views and recommendations. Also, Taiwan's delegation to the recent World Summit in Johannesburg exhibited materials, such as photos and brochures, collected at the summit.



Minister of State Yeh Chun-jung (standing) chairs conference on the National Sustainable Development Action Plan.

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