Environmental Policy Monthly

Environmental Protection Administration, Taiwan, ROC

Volume VII, Issue 8 August, 2004

Feature Column

Improved Management Creates New Image for Incinerators

Incinerators have become the primary means of waste disposal in Taiwan as landfills take a less predominant role. Working to improve the image of incinerators, the EPA has gone all out to strengthen citizen participation in supervision mechanisms and to set up facilities for sorting trash, and reusing fly ash and bottom ash. These comprehensive recycling initiatives are expected to help create a zero-waste society.

Incessant population growth and rapidly increasing economic activities have led to a daily rise in the amount of waste generated by mainstream society. With environmental consciousness on the rise, waste management has already become a focal issue of government policy. Based on waste sampling and analysis results for the Taiwan Area, over 80% of garbage generated in Taiwan is combustible and suitable for incineration.

Incineration Preferred Over Direct Landfilling

Incineration is the preferred method of waste disposal in many developed countries as it uses high temperature oxidation to transform waste into stable substances and gases. Incineration reduces materials to only one tenth of their original volume and the resulting energy and byproducts can be utilized in other applications. For this reason, modern incinerators are often referred to as waste resource recovery plants. Through a combination of citizen cooperation and the EPA's diligent efforts to promote resource recycling, garbage volumes have decreased over the years. As of the end of December 2003, already up to 98.18% of garbage was considered appropriately managed, and 59% of the total volume of garbage generated last year was incinerated.

Looking back on Taiwan's waste management policies, the traditional method of landfilling was predominant in the early years. The "Municipal Waste Disposal Plan"

Modern incinerators are environmentally friendly centers for efficient recycling of resources.

In This Issue

came out in 1984 at which time only 2.4% of waste was disposed of through appropriate channels. By 1991, it was decided that waste disposal plans should work toward adopting incinerators as a primary means of disposal, while landfills should only be used as an auxiliary measure. The EPA Department of Incinerator Engineering was established soon thereafter, taking on the tasks of seeing to the construction of incinerators, promoting waste incineration technology transfer and privatizing waste resource recovery plants.

In 1991, the Executive Yuan ratified the "Taiwan Area Waste Resource Recovery (Incineration) Plant Construction Plan" (**台灣地區垃圾資源回收（焚化）廠興建工程計畫**), which called for the establishment of 21 incineration plants. Already 18 of these plants have been built to date and the remaining three are currently under construction in Yilan, Keelung, and Tainan (Yongkang). In 1996, the Executive Yuan approved the "Plan to Encourage Public/Private Organizations to Build and Operate Waste Incinerators"**(鼓勵公民營機構興建營運垃圾焚化廠推動方案)**. This plan initially called for building 15 more plants, raising the total number of incinerators to 36, but the Executive Yuan later reduced this by 9 plants, to a total of 6 plants in addition to the previously planned 21 plants. One of the six has already been completed and the other five are still under construction. Thus 19 plants are currently in operation.

Stronger citizen opposition in recent years, as well as the common view of incinerators as NIMBY facilities, has made it more difficult to obtain land and carry out construction. Considering a wide range of factors and responding to citizen's wishes, the government plans to further reconsider the number of plants to be constructed. Last year the EPA was requested by the Executive Yuan through the proposed "Vision and Review of the Waste Management Plan" to reconsider plans to construct certain incinerators. The Executive Yuan informed the EPA on May 25 that plans to build incinerators in Nantou, Hualien and Penghu Counties had been suspended. Thus, out of the 36 originally planned incinerators throughout Taiwan, only 27 are still confirmed. For those counties and cities that do not have incinerators within their jurisdiction, the EPA will adopt models for complete sorting, waste reduction, and regional cooperation to resolve local waste management problems.

To ensure comprehensive implementation of the policy to sort all garbage and to reduce the amount of pollution from incinerators, the EPA has drawn up a set of criteria for managing waste as it enters incineration plants.

Incinerator Management Adopts Comprehensive Supervision and Controls

To ensure comprehensive implementation of the policy to sort all garbage and to reduce the amount of pollution from incinerators, the EPA has drawn up a set of criteria for managing waste as it enters incineration plants. These criteria demand strict source management and entry controls at the gates of incineration plants before trash is allowed to enter the plants. Further downstream, the *Incinerator Audit and Evaluation Guidelines* **(焚化廠查核評鑑要點)** have been formulated as a basis for managing the actual incineration process. Lastly, the *Criteria for Managing the Disposal of Waste Incinerator Ash* **(廢棄物焚化灰渣處置管理規範)** has been drawn up for the final disposal of ash. The above three sets of criteria and guidelines ensure that management of both upstream and downstream incinerator operations adhere to inclusive standards. These three sets of rules will be announced and put into implementation before the end of this year (2004) and violations will be penalized according to stipulations in the *Waste Disposal Act* **(廢棄物清理法)**.

While supervision of operations and pollution control are of chief concern, another fundamental problem associated with incinerators is that incineration capacity may exceed actual waste volume. According to EPA statistics, if all incinerators currently under construction are completed by 2006, a total of 27 incinerators will be in operation, 21 of which are publicly owned. This would allow for the disposal of a combined total of 18,600 tonnes. Each of the remaining six privately owned incinerators have a disposal capacity of 3,000 tonnes, allowing for a combined total of 21,600 tonnes. However, the actual volume of waste requiring disposal in 2003 was only 16,880 tonnes.

From 2003, the EPA began a pilot project to let municipal waste incinerators accept combustible general industrial waste. With the gradual decrease of household generated waste and the consequent increase in waste disposal capacity at incinerators, the inclusion of general industrial waste as fuel for municipal incinerators is seen as an appropriate solution to fulfilling the capacity requirements of these

large-scale incinerators.

The issue that prompts the greatest amount of concern among citizens however is dioxin control. The EPA has addressed this problem by drawing up stricter standards such as the *Waste Incinerator Dioxin Control and Emission Standards* **(廢棄物焚化爐戴奧辛管制及排放標準)**. This rule requires all incinerators to undergo regular testing for dioxin in flue gas twice per year as of January 1, 2004. According to the *Regulations Governing the Recycling, Clearance and Disposal of General Waste* **(一般廢棄物回收清除處理辦法)**, bottom ash and treated fly ash toxicity characteristic leaching procedure (TCLP) test results should not exceed the *Standards for Defining Hazardous Industrial Waste* **(有害事業廢棄物認定標準)**.

As for ash left over after incineration, the EPA has formulated the Waste Incinerator Treatment and Ash/Residue Reuse Management Implementation Plan **(廢棄物焚化處理及灰渣再利用管理實施計畫)**, which adopts two guiding principles to: 1) prevent substandard waste from entering the plant, and 2) ensure appropriate treatment and promote reuse of ash/residue. The plan also implements six important strategies: 1) design and set up incineration and reuse baseline data, 2) establish incineration and reuse management information system, 3) establish entry and exit point management system for waste (ash/residue) incineration, 4) evaluate ash/residue reuse technology and plan strategies to promote and use recycled products, 5) establish incineration and reuse supervision and long-term tracking system, and 6) review and modify ash/residue testing methods and rules. These six strategies are further reinforced through twenty concrete projects, which are slated for completion in 2006.

Incinerators Show Good Performance in Yearly Audits

The EPA announced the *Waste Resource Recovery (Incineration) Plant Audit and Evaluation Guidelines* **(垃圾資源回收(焚化)廠查核評鑑要點)** on April 13. The scope of audits and evaluations includes operations, maintenance and management, and covers a wide range of various indicators and scoring criteria.

The automatic scoring system for operation efficiency indicators is based on performance indicator data regularly entered in by incinerator operators. Performance indicator scores are calculated by a computer program. An audit and evaluation committee makes onsite inspections and rates performance twice per year, during the first and second halves of each year. This committee also appraises performance during onsite audit and evaluation. The work secretariat (EPA Department of Incinerator Engineering) is responsible for carefully reading related reports and charts and the status of administrative cooperation and evaluating normal performance. Finally the committee grades each incinerator in three categories and performs different calculations to determine the total score. Evaluation results are then announced based on this score.

Based on a compilation of the latest audit and evaluation results, incinerators have the following strong points:

Incinerator grounds are green and attractive, facilitating efforts to change the public's negative impression of incinerators.

Interaction and communication with neighboring residents is good, helping to establish a new and positive image of environmental facilities.

Professionalism of staff has greatly increased and data on operations is impeccable.

There is open access to information online and citizens concerns are acted upon immediately.

Regular prevention drills have greatly decreased the number of work accidents.

Technology exchange partnerships exist between companies so that friendly competition increases both parties' performance.

Appropriate responses have been made toward past reviews and recommendations, fulfilling the objective of continual improvement.

Monthly reports are on time allowing for effective control of operation data.

Incineration plants are expected to strengthen efficiency of waste incineration and energy recycling.

News Brief

Four Counties/Cities Included into 0.5% Sulfur Fuel Control Areas

On July 19, the EPA held a public hearing on a draft regulation to strengthen oxysulfide emission controls of stationary pollution sources. Hsinchu County, Hsinchu City, Miaoli County and Yilan County will be added to the list of regions where liquid fuel with sulfur content exceeding 0.5% is designated as a substance that easily causes air pollution. After the new regulation is officially announced, the regulation is expected to take effect on February 1, 2005.

Incineration plants are expected to bring out the following improvements in the future:

1. Put into practice incinerator maintenance management to extend the lifetime of facilities and equipment.
2. Strengthen efficiency of waste incineration and energy recycling.
3. Strengthen control of secondary pollution such as dioxin and heavy metals from incineration processes; effectively reduce emissions of these toxins, safeguard public health and protect the ecology.
4. Increase transparency of incineration plant management and strengthen public participation in supervisory mechanisms; become energy and environmental education centers; establish a positive image for incinerators.
5. Cooperate with plans to promote installation of garbage sorting facilities, fly ash and bottom ash reuse facilities, thereby comprehensively and effectively recycling waste; help create a sustainable society that generates zero waste.

Air Quality

Vehicle Diesel Fuel Sulfur Lowered to 50ppm Ahead of Schedule

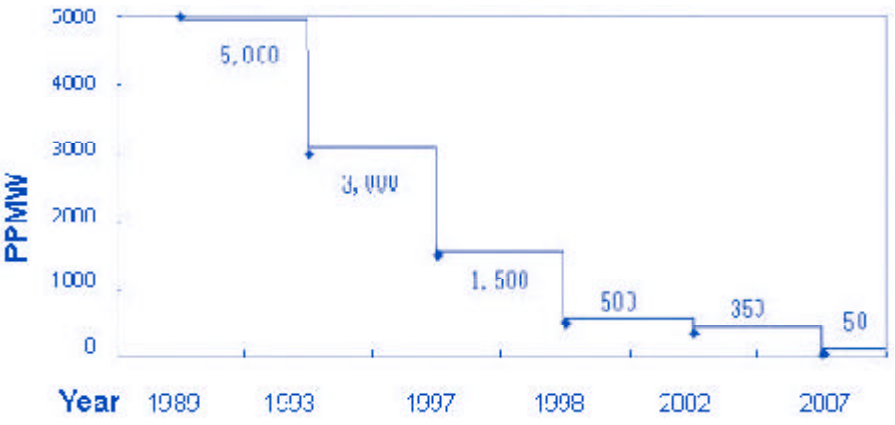
Propelled by the EPA's leadership, local companies Chinese Petroleum Corporation (CPC) and Formosa Petrochemical Corporation have announced that they will begin production in June and September, respectively, of low sulfur content diesel fuel containing only 50ppm. This move will meet the standards set for 2007 far in advance.

In recent years the EPA has been working hard to coordinate with international trends by taking further steps to improve diesel fuel emissions. To actualize these objectives the EPA has engaged in constructive communication and cooperation with local petroleum product manufacturers CPC and Formosa Petrochemical Corporation, taking into consideration any additional cost increases that might be incurred. On April 29, 2004, revisions to the air pollution control fee rate were put into effect, which included a new graded fee system for motor vehicle diesel fuel. A lowered motor vehicle diesel fuel air pollution control fee of NT$0.1 per liter shall be levied for diesel fuel containing a sulfur content of 50ppm or less, thus providing the two oil companies with an incentive to begin producing supplies earlier than anticipated.

In addition, the EPA is also cooperating with Taipei City and other local environmental protection authorities to promote the use of 50ppm low sulfur diesel fuel at private fuel storage facilities operated by transportation and shipping companies as a means of further stimulating market demand. Ultimately, the two oil companies committed to this initiative and announced their plans to begin producing 50ppm low sulfur motor vehicle diesel fuel in June and September, respectively, enabling the standards set for 2007 to be actualized ahead of schedule. Regarding gas stations, it is estimated that motor vehicle owners will be able to fill up with 50ppm low sulfur diesel fuel in October after existing stocks of 350ppm diesel fuel have been sold.

The EPA notes that the latest research reports from England indicate that not only does motor vehicle exhaust exacerbate conditions in those who have asthma; it is also a source causing healthy people to develop asthmatic symptoms. The study further reveals that diesel fuel vehicles present the most serious health risks. Experts from England explained that diesel fuel vehicles emitted ambient fine suspended particulate matter, which presents the most serious harm to health. According to statistics, England has the highest number of asthma patients in the world with 20 thousand new cases occurring every month.

The EPA believes that if the sulfur content in diesel fuel is reduced



Diesel fuel sulfur content standard controls over the years

from 350ppm to 50ppm then the ambient particulate matter emitted can be reduced by 7% in light diesel vehicles and 4% in heavy diesel vehicles. Particulate matter emissions can be reduced by 1,500 tonnes annually (constituting 4.4% of mobile pollution source emissions) and oxysulfide emissions can be reduced by 3,213 tonnes (constituting 69% of the mobile pollution source emissions), measures that will effectively improve environmental air quality. Diesel vehicles that use low sulfur diesel fuel produce a lower level of sulfuric acid, which reduces the amount of corrosiveness and abrasion in their engines thus extending the amount of time necessary for an oil change and lengthening the life of the catalytic converter. Another positive point for the consumer is that the two oil companies will not be increasing diesel fuel prices. Motor vehicle owners will be free of additional costs and will also save a lot of money on costly repairs.

EIA

EPA Calls for Careful Evaluation of Su-Hua Expressway Proposal

After Taiwan experienced a series of treacherous natural disasters, people from all circles have become more concerned about the rezoning of public land. As there is still some time before the Su-Hua Expressway environmental impact assessment is approved, the EPA has called on the Taiwan Area National Expressway Engineering Bureau to be more careful in its assessment of major environmental changes made to public land, and to make a substantial commitment toward implementing environmental protection countermeasures.

People in all fields have become more and more concerned about environmental impact assessments (EIA) in recent years. On July 28, the EPA convened an EIA review committee meeting for the Suhua Expressway construction project, during which it was decided that the Ministry of Transportation and Communication Taiwan Area National Expressway Engineering Bureau (TANEEB) should first provide additional detailed plans of environmental changes over time and sustainable development of national land. The Bureau should then very carefully proceed with evaluation work and keep their word to implement environmental protection strategies.

The aforementioned "environmental changes over time" include: 1) cost-benefit analysis of upgrading the east coast railway system, 2) assessment of the benefits of freeway transport speed and quality of travel, 3) assessment of financial benefits of alternative plans, 4) evaluating the impacts on indigenous development and scenery due to development of primary and secondary road systems of the Su-Hua Expressway under national land sustainable development principles, and 5) risk assessment of how natural disasters such as Typhoon Mindulle would impact Hualien's major rivers. These factors would all be carefully considered when evaluating transportation planning.

Since the EIA for the Su-Hua Expressway was passed in 2000, vast environmental changes have occurred such as the September 21 earthquake and Typhoon Mindulle. To safeguard national land and prevent EIA reviews from becoming fragmented, the EPA has advised TANEEB to proceed more carefully with evaluation work and propose a substantial commitment to come up with environmental protection countermeasures.

Many public figures in the environmental field hold the opinion that in 2000 the central government failed to demarcate soil and water conservation areas and areas where streams are prone to landslides on public land. After experiencing many years of typhoons and serious disasters, it is evident that earthquakes make ground strata more friable and susceptible to erosion. It is also clear that overdevelopment is the predomi-

Activity

Environmental Consensus Forum — Citizens Welcome to Discuss Issues Online

The EPA website environmental consensus forum officially opened up for discussion on July 21. Aiming to enhance open access to information and full citizen participation, citizens are invited to express their concerns about environmental policy or issues in this open forum. The forum lends itself to convergence and exchange of a diverse range of opinions, and contributes to the formulation of mainstream environmental opinions and values. The following four forum topic questions have been submitted by scholars: "How to promote cross-regional cooperation in waste management?" "How to make environmental information more open to the public and increase public participation in environmental issues?" "How to carry out the Complete Sorting for Zero Waste Plan?" and "While adhering to the Polluter Pays Principle, is it necessary to expand and integrate legislation on the collection of each category of pollution control fee?" The public is welcome to participate in discussion about these issues online.

nant reason why typhoons are causing grave disasters in western Taiwan. In the interest of conserving soil and water resources, protecting water tables, reducing the occurrence of disasters and strengthening the management and maintenance of soil and water conservation areas, environmentalists advise the government to pay special attention to the problems of soil and water conservation when carrying out assessments.

Recycling

Newly Drafted Packaging Rules Announced

Public opinion surveys reveal that the nation's citizenry disapproves of over-packaged products and supports government action to lay down controls. In addition to previously announced regulations to control packaging, the EPA has recently drafted legislation that calls for two stages of controls on the packaging of candy, pastries, cosmetics, CDs and alcohol and processed food. The first stage of controls will be effective as of January 1, 2006.

Along with an increased GDP and advances in packaging technology, packaging of gift boxes has become increasingly elaborate and extravagant in the last few years. More and more frequently, the public has been voicing complaints about the problem of recycling and disposing of waste generated by such superfluous packaging. It is high time to confront the issue of how to both fulfill packaging requirements and at the same time decrease the environmental impact of packaging waste.

Based on results of two EPA public opinion surveys carried out in 2000 and 2003, the percentage of citizens identifying a serious problem with excessive packaging of gift items jumped from 60.9% to 68.9% in three years. Citizens' concerns about over-packaging are that too many layers of packaging are used, the proportion of unused space is too high, packaging costs are too high, and too many different types of packaging materials are used. The ratio of citizens expressing unwillingness to pay a higher price for over-packaged products or frilly packaging sharply increased from 77.5% to 92.7% between 2000 and 2003, attesting to the public's disapproval of over-packaged products. As for packaging reduction policies set down by the government, 82.4% of citizens surveyed in 2000 showed support for such measures, increasing to 91.4% in 2003. This indicates that over-packaging has become a serious problem from the public's standpoint and there is strong support for the government to adopt control measures.

Drawing on existing waste reduction policies, the EPA has referred to the basic demands laid down by Britain and France under the European Union's Packing and Packing Waste Directive, as well as South Korea's over-packaging control regulations and implementation experience. In accordance with Articles 13 and 14 of the *Resource Recycling Act* **(資源回收再利用法)**, the EPA announced the draft *Restrictions on Ratio of Empty Space, Number of Layers, and Type/Number of Different Materials in the Packaging of Candy, Pastries, Cosmetics, CDs, Alcohol and Processed Food* **(糖果、糕餅、化粧品、光碟、酒及加工食品之包裝空間比例、層數、使用材質之種類及數量限制草案)** on July 1, 2004. This restrictive measure will be implemented in two stages, eventually to limit the ratio of unused space in packaging (to under 25% of the entire volume), the number of packaging layers (to under three layers), and the type and number of different materials used (different types of packaging materials may not be combined except in the packaging of individual items).

To give manufacturers adequate time to respond to these restrictive measures, the EPA is currently convening a series of public hearings with the various targeted industries and is open to opinions from all circles. If all goes as planned, the first stage will be implemented on January 1, 2006, first targeting candy, pastries, cosmetics, CDs and alcohol products. The second stage will be implemented on January 1,

News Brief

Fines for Violating Plastic Bag Restriction Reduced to NT$1200-6000

On July 19, the EPA announced a new regulation to make the current restricted use policyon plastic bags and disposable tableware fit in with actual circumstances and private sector demands. Revisions were made to redefine which businesses are subject to the restriction and modify implementation methods and fines. The regulation provides stronger legal ground for citizens and makes it easier for environmental agencies to put the law into practice.

The most noticeable modification is that fines have been greatly reduced. New stipulations state that first time offenders will be issued a warning notice; second time and repeat offenders will be reported and subject to fines between NT$1,200 and NT$6,000, according to Article 51 of the *Waste Disposal Act.* Offenders who fail to improve business practices before the said deadline will be subject to daily continuous fines.

2007 and will be extended to include all processed foodstuffs. The exact date of implementation will be reviewed based on opinions gathered from the targeted industries.

According to Article 21 of the *Resource Recycling Act*, this restriction also stipulates that all manufacturers, importers and retailers shall provide free products for inspection purposes as well as supply information regarding targeted retailers, date of retailer purchase, source of products, and date of delivery to facilitate the implementation of controls. After implementation, this restriction will lead to good packaging design that saves resources, is easy to recycle and reduces the amount of waste generated by packaging material. For more information, please contact the Department of Waste Management at 02-23705888 ext.3606.

Environmental Analysis

New Biotechnology to Be Applied to Environmental Analysis

In place of the costly and time-consuming traditional HRGC/HRMS testing methods, the EPA has adopted cutting-edge rapid dioxin screening and detection biotechnology, and microbial molecular analysis technology from the Netherlands. These technologies will be applied during remediation of pollution sites and for testing environmental samples. The new biotechnologies produce excellent results and lend themselves to advancements in traditional sampling and analysis technology.

Extensive dioxin pollution occurred in Belgium in April 1999, resulting in dioxin contamination of livestock feed at around 1,000 farms. The incident sparked a period of worldwide panic as all meat and egg products were taken off the shelves and the country suffered tragic economic loss of over one billion Euros. Since then, continual advancements have been made in environmental monitoring technology as a measure of precaution against further calamities. The EPA is currently investing a great deal toward developing this field.

Biotechnology and electronic technology are widely thought to be the most important technologies of this era. Biotechnology has an extremely broad range of applications and is seen as the technology that will have the most influence on the shape of the future. The EPA has recently developed new biotechnology including rapid dioxin screening and detection biotechnology, and microbial molecular analysis technology, finding practical applications in pollution site remediation and environmental sampling and analysis. These new technologies are not only extremely effective but also greatly facilitate improvements to traditional environmental monitoring technology.

In recent years the EPA has devoted much effort toward the remediation of dioxin contaminated pollution sites. However, oftentimes when determining pollution boundaries, testing instruments are easily contaminated due to acute differences in sample concentrations. Moreover, traditional High Resolution Gas Chromatography and High Resolution Mass Spectrometry (HRGC/HRMS) methods are costly and time-consuming and it's often impossible to complete the mission in a short period of time. Therefore the EPA has introduced EU-certified rapid dioxin screening and detection biotechnology developed in the Netherlands. This technology can be applied to various environmental base quality samples for dioxin analysis.

The EPA has already put this technology to practice in pollution site remediation and environmental monitoring. Apart from showing a high linear correlation with traditional HRGC/HRMS technology, other strong points of this biotechnology are its speed, accuracy, simplicity and low cost. The EPA indicates that in the future, large numbers of dioxin samples can first undergo the rapid dioxin screening and detection biotechnology method for screening, and later undergo chemical analysis if necessary. This offers multiple advantages of accuracy, speed, and economy.

Microbial analysis is one of the EPA's most important tasks. In the past, most traditional analysis technology required first cultivating microbes and then analyzing their biochemical characteristics. This is a lengthy process and it is often impossible to differentiate characteristics due to poor sensitivity of just a few microorganisms.

To solve this problem, the EPA has developed real time reverse transcription-polymerase chain reaction (RT-PCR) analysis technology, which can identify dioxin-responsive genes of water body pathogens. Water body samples that may contain only minute quantities of Salmonella and Shigella DNA are put through highly sensitive RT-PCR testing to successfully analyze whether the water body has been contaminated by either of these two pathogens. Practical applications of this technology have already been successful in testing for pathogens in spring water.

After developing such biotechnology for less than two years, the EPA has already obtained preliminary results. As advancements in biotechnology proceed with great speed, the EPA aims to stay abreast with the latest science by developing and introducing environmental applications of biotechnology that fulfill the demand for precision and speed and ultimately improve environmental quality.

Water Quality

Wastewater from Hot Springs and Ancillary Restaurants to be Treated Separately

The EPA has launched a study on the management and control of wastewater from hot springs establishments and ancillary restaurants. Specialists have formulated a preliminary plan to allow non-soapy wastewater from public pools to be directly discharged into streams and sewers; however, wastewater from showers, private rooms, and restaurants must first pass through a wastewater treatment system before discharge.

Endowed with abundant hot springs resources, Taiwan must contend with increasing amounts of pollution from hot springs wastewater along with the growing number of tourists at hot springs. According to a recent survey, Taiwan has 128 hot springs sources, 42 of which are located in source water quality protection areas.

At the beginning of the year, the EPA commissioned an academic organization to carry out a survey of hot springs environments, including the status of pollution and how it is being prevented and controlled. The EPA also recently entrusted the National Taiwan University Graduate Institute of Environmental Engineering (GIEE) to carry out an investigation of wastewater from hot springs establishments and ancillary restaurants. Enterprises chosen from fifteen hot springs areas were investigated for hot springs water quality, wastewater generated, operating status and the actual status of pollution. GIEE has estimated the degree of pollution and initial results are already available.

Results of the survey carried out by GIEE showed sixty percent of the nation's hot springs industry directly discharges wastewater from private guest rooms into streams or sewers. Seventy percent of businesses follow similar practices for hot springs bathwater and restaurant wastewater.

One fact deserving attention is that nearly half of the 95 larger scale hot springs are located within source water quality protection areas. Wastewater generated by hot springs hotels and restaurants have polluted water sources and have had a grave impact on river ecology.

The EPA invited academia to offer their views on this preliminary research report. Most scholars surmised that there is no significant difference in the quality of water before and after use at public hot spring pools and bathhouses. At the most, wastewater merely contains flakes of skin from bathers. Water from such pools can either be directly discharged into rivers or the EPA can show enterprises ways to reuse this wastewater for example by watering plants and fruit trees. Special controls would be required only if hot springs water is extracted and discharged in great quantities, which could suddenly increase the temperature of river water or cause an acute change in pH of river water.

In general, the pollution from hot springs wastewater is not from the hot springs water itself, but rather from additional substances that go down the drains of guest rooms and restaurants. Scholars therefore suggested that all hot springs enterprises should be required to promptly devise two different drainage systems to separate pool water from guest room and restaurant wastewater, with separate treatment systems for each type of water. Care should also be taken to ensure that shower water containing cleaning agents like shampoo and soap is not mixed with the drainage system exclusively for hot springs bath water.

EIA

Pond Ecology Focus of EIA Reviews

Based on a recent ecological survey of estuaries, wetlands and ponds in the Taoyuan plateau, it was found that the once widespread ponds in this area have rapidly disappeared throughout different phases of urban and transportation development. Rezoning of agricultural land has had a strong impact on the distribution and populations of bird species. The EPA has responded by giving more emphasis to the ecological value of ponds in future environmental impact assessment reviews.

Raising awareness of the steady degradation of Taiwan's ecology

over the years, the EPA explains that according to the "Tanshuiting Annals" (淡水廳志), the first pond on the Taoyuan plateau appeared in Longtan (龍潭大池) in 1748, with a history of 256 years. In the heyday of subsistence aquaculture in Taiwan, ponds occupied 11.8% (8,990 hectares) of the Taoyuan plateau. Land development since then has reduced this ratio to only 3.8% (2,898 hectares), meaning that already 6,100 hectares of pond habitat has vanished.

A field survey carried out by the Taoyuan Wild Bird Society found an average of seven winter migratory birds on each hectare of pond surface area in Taoyuan. The loss of 6,100 hectares thus puts a squeeze on the habitat area of about 42,700 migratory birds. The EPA advises that in order to protect the ponds and uphold the sustainability and value of pond ecology, land use of adjacent areas must be carefully considered. Unnecessary construction should be avoided near the rich ecology of pond areas.

As for improving landscape design, the EPA pointed out that the edge of water bodies and vegetated areas can be maximized by increasing the waviness of their perimeters. Low rock walls and rock piles can be used to control slopes and prevent slumping of shorelines. Other methods to prevent erosion along curved pond edges include planting aquatic plants, piling up existing dead vegetation, and constructing low retaining walls. Aquatic and wetland plants can be used to stabilize pond shallows, and water levels can be lowered at appropriate times to suit a variety of habitat requirements for different birds.

Conservation work needs to be strengthened in ways that integrate the ecological, utilitarian, historical and cultural values of the ponds. EIA reviews of future development projects will take into consideration the effects of development activities on habitat and pond life. In addition to adhering to technical standards for assessing animal and plant ecology, the EPA will require briefings on the environmental status of ponds and nearby development areas as well as animal and plant ecology background surveys, assessments of ecological impact on flora and fauna, and environmental monitoring. For areas already subject to development pressures, the EPA will strengthen promotion of habitat restoration within pond and wetland environmental impact boundaries to protect these invaluable natural resources.

The rich ecology of ponds will be given top consideration in future EIAs (source: EPA website)

Recycling

Taiwan to Promote Labeling of Secondhand Home Electronics

Unscrupulous behaviour is widespread in Taiwan's home electronics market. To prohibit electronics enterprises from selling secondhand goods as new products to unwary consumers, the EPA and the Ministry of Economic Affairs have jointly set up the "Working Group for the Management of Unlabeled Reused Goods." The MOEA will strengthen commodity inspection checks, while the EPA will utilize the Resource Recycling Act to require labeling for secondhand home appliances such as televisions and air conditioners.

Case after case of bogus merchandise were discovered this year, many of which involved unmarked reused household electronics. In many cases, used items including televisions, air conditioners, printers, mattresses and other products in daily use by consumers were interspersed with new products on the shelf. Dishonest businesses were deceiving consumers and profiteering on secondhand goods sold as new products.

To prevent consumers from purchasing sham products from deceptive storeowners, the EPA has joined forces with the Ministry of Economic Affairs in a cross-departmental "Working Group for the Management of Unlabeled Reused Goods," which will ensure clear labeling of the source of reused products, put an end to bogus merchandise and protect consumer rights. During the first meeting held on August 2, a consensus was reached for the MOEA to focus

more attention on commodity inspection labels for new products and thoroughly check products in storage. Consumers can then base their selection on this information when shopping. In order to better manage secondhand reused products, the EPA will establish a system for using and labeling recycled and reused renewable resources. EPA will soon announce the scope of enterprises subject to related rules, which will be based on the *Resource Recycling Act* (資源回收再利用法).

Regarding labeling of secondhand goods, Department of Waste Management Deputy Director Yang Ching-hsi（楊慶熙）related that the most important task at hand is regulation of products in daily use such as televisions, air conditioning, and refrigerators in the first stage. All recycled or reused products must be labeled as secondhand to prevent businesses from selling them as new products.

General Policy

Environmental Service Industry Shows Strong Potential

The EPA recently convened the Environmental Service Industry Preparatory Conference. Whether from academia, government, or the private sector, most participants were supportive of promoting resource recycling in the environmental service industry and opening up Taiwan's doors to imports of waste materials designated as mandatory recyclables. The environmental service industry is forecasted to reach an output value of NT$71.2 billion next year (2005).

Studies show the output value of the environmental protection service industry comprised 34.6% of the domestic environmental market in 1999, generating a total of NT$64.4 billion. Already 80% of all domestic environmental businesses are in the environmental service industry, for a total of 2,286 companies. Taiwan's environmental service industry is expected to boom in terms of output value, which is likely to reach NT$71.2 billion by 2005.

Recognizing the importance of developing the domestic service industry, the Council of Economic Planning and Development (CEPD) is preparing to hold the "National Service Industry Development Conference" on September 2 at the Taipei International Convention Center. The environmental service industry has been listed as one of twelve service industries at the focus of development efforts. To solicit advice from related departments, scholars, and industry, the EPA held an "Environmental Service Industry Preparatory Conference" on July 16, inviting representatives from related fields. EPA Deputy Administrator Tsay Ting-kuei (蔡丁貴) and Deputy Chairman Yang Jyh-Shing（楊致行）of Industrial Technology Research Institute's Center for Environmental Safety, Health and Technology Development presided over the meeting. Authorities from the CEPD, Ministry of Economic Affairs, and Council of Agriculture were in attendance along with numerous representatives from environmental academic circles and environmental NGOs.

The theme of the meeting was "Environmental Service Development Principles and Action Plan —Assisting the Resource Recycling Service Industries." Five main subtopics were discussed: "Industries that Process Mandatory Recyclables," "General Waste and Food Waste Recycling and Reuse," "Large Waste Item Recycling and Reuse," "Construction Materials—Resource Reuse and Appropriate Clearance/Disposal Plans," and the "Environmental Science and Technology Park Promotion Plan."

During discussion on feasibility and related control measures for opening up Taiwan's doors to the import of waste materials designated as mandatory recyclables, many participants showed their support of such a proposal. However, all participants recognized the need for a complete set of measures to ensure thorough import inspections, verification procedures, tracking of the source of imported waste materials and management of byproduct waste materials leftover after recycling.

Academia members in attendance indicated that many industrialized nations have long ago opened up to imports of recyclable waste, allowing them to greatly expand the profit base of resource recycling industries and offset scarcities of certain natural resources. For example, some countries have opened up to imports of scrap automobiles in order to overcome domestic shortages of copper and iron. While such practices kill two birds with one stone so to speak, comprehensive measures must first be established and current distribution of the nation's resources should be given due consideration.

As for the development of food waste reuse channels, apart from the two current methods of reuse as pig feed and compost, many scholars strongly recommended Taiwan consider the German model of anaerobic processing to produce methane as a renewable energy source, or high temperature drying to produce animal feed. The high temperatures used in the

latter method would quell common fears that pigs might fall ill due to inadequate sterilization of food waste, or that the quantity of compost produced would too small to be cost efficient. The EPA indicated these suggestions would be referred to in follow-up revisions of related plans.

Water Quality

EPA Clamps Down on "Night Pipes"

In the first half of 2004, the EPA and local environmental protection bureaus discovered 30 "night pipes" — the local term for hidden wastewater outlets. Twenty of these were from pig raising operations. Even though all of the businesses own wastewater treatment equipment, they defiantly chose to bypass such facilities and directly discharge their effluent into the environment. Showing resolve to lay down the law, the EPA has announced a clampdown against such violations and will administer heavy penalties in the future. Such cases will not be treated lightly anymore.

The EPA's Three Year Action Plan includes a river pollution reduction strategy, which focuses on the "Plan for Wastewater Discharge Control and Inspection of Night Pipes at Currieries, Livestock Businesses, and Construction Earth Deposit Sites." From January through June this year (2004), the EPA found that effluent discharged from 12 currieries, 162 livestock industries and two earth extraction plants did not meet the Effluent Standards. Furthermore, thirty concealed "night pipes" were discovered during these inspections.

Taiwan has a total of 114 registered currieries, which generate a chemical oxygen demand (COD) of about 67,762 tonnes. The nation's pig raising operations currently have around 6.8 million pigs, which generate about as much organic pollution as 17 million humans. Especially considering that effluent standards for these two industries have only recently been relaxed by a reasonable degree, Taiwan's rivers could be seriously jeopardized if these industries don't take appropriate improvement measures.

From January to June this year the EPA assisted local environmental protection bureaus (EPBs) to carry out inspections. Of the 263 inspections made at currieries, 12 companies failed inspections, with substandard water quality measurements as high as 12,700 mg/l — 127 times greater than the stipulated effluent standard of 100 mg/l. Pig raising industry effluent standard for COD was relaxed from 250 mg/l to 600 mg/ml on November 26, 2003. Also from January to June a total of 4,838 inspections were made at pig raising farms. Substandard water quality was detected during 162 inspections with substandard water quality measurements as high as 131,000 mg/l, or 218 times greater than the stipulated effluent standard.

In the same period of time, 440 inspections were carried out at construction earth deposit sites and two inspections showed substandard wastewater discharges. The EPA conveys that many companies with substandard discharge have little sense of social responsibility and sometimes don't bother to treat their wastewater or sludge at all before discharging. Such behaviour ends up seriously polluting the environment and necessitates stricter controls.

The EPA indicates that the government has invested a large amount of funds toward river remediation. This effort is for naught if a few enterprises fail to appropriately treat their wastewater and arbitrarily discharge substandard wastewater into the environment. The EPA is resolved to crack down on any enterprises that knowingly disobey the law, and heavy penalties will be administered.

General Policy

Environmental Poll Shows Air Pollution Is Top Citizen Concern

According to the EPA's latest public opinion poll, air pollution is regarded as the most serious environmental problem in Taiwan. River pollution and inappropriate disposal of household garbage were the next two topics of public concern.

From April 22 to May 14 this year (2004), the EPA took a public opinion poll through a random nationwide telephone survey. The survey elicited 4,713 effective responses. Results showed 46% of respondents felt that air quality has not improved this year, while 16% of citizens said that it has improved, and 19% said air quality has deteriorated compared to last year.

Most respondents listed air quality as the pollution problem requiring the most improvement, with vehicle exhaust as the most serious problem, followed by factory pollution, malodorous oil smoke, and construction site air pollution.

In recent years, the EPA has embarked on a project to improve vehicle pollution. Regular inspections of motorbike exhaust are an integral part of this project. The survey showed that 95% of re-

spondents are aware of this regular inspection system; the actual inspection rate last year reached 65%.

The survey revealed that 20% of people do not use tap water as a primary source of drinking water. The main reasons indicated were bad water quality, strong odor of disinfectants and malodor of tap water.

The EPA has established an environmental complaint hotline to encourage people to report pollution. The survey shows 3.6% of respondents have ever reported pollution cases; 44% of respondents indicated that they do not know how to report pollution cases. Of those interviewed, 49% indicated that their neighborhood environment has improved in terms of cleanliness in recent years. Furthermore, 74% people agreed that the EPA's daily announcements of air quality and the ultraviolet ray index (UV-I) are indeed necessary.

As for the problem of neighborhood noise disturbance, 25.5% of the populace indicates that they have been bothered by noise in their neighborhood recently. owever, 45.5% of people were not aware that neighborhood noise should be processed by police agencies and that it is possible to draw up formal mutual agreements with neighbors regarding neighborhood noise levels.

Based on the *Noise Pollution Control Act* **(噪音管制法)**, environmental protection agencies must first measure the noise, and the noise must last for more than eight minutes before it can be judged as over the standard or not. However, most neighborhood noise is characterized as "discontinuous." Thus continuous noise measurements are not representative of the actual degree of disturbance. According to the present division of authority and responsibility, residential area noise disturbances should be handled by police agencies.

News Briefs

Four Department Directors Shuffled

The EPA announced that as of July 19, positions of four department directors will be shuffled. The following adjustments have been made:

Name	Former title	New title
Ho Soon-ching (何舜晴)	Director of Department of Environmental Sanitation and Toxics Management	Director of Department of Air Quality Protection and Noise Control
Leu Horng-guang (呂鴻光)	Director of Department of Air Quality Protection and Noise Control	Director of Department of Water Quality Protection
Chen Shean-rong (鄭顯榮)	Director of Department of Water Quality Protection	Director of Environmental Professionals Training Institute
Wang Lung-chic (王龍池)	Director of Environmental Professionals Training Institute	Director of Department of Environmental Sanitation and Toxics Management

Criteria Announced for Water Pollution Control Permit Fee

In consideration of the demand for extensive reviews, the criteria for water pollution control categories permit application fee collection have been readjusted to simplify administrative procedures for the public and to comply with previous revisions to the Water Pollution Control Act. The new fee criteria became effective as of July 14. In the future, the EPA will follow the Water Pollution Control Act in implementing the Water Pollution Control Measures Plan, and reviewing and registering permit fees, documents, modifications, extensions, and precast concrete building wastewater management facilities. Fees are listed in the appendix chart of the revised criteria.

Environmental Policy Monthly, Taiwan, R.O.C.

Publisher
Dr. Chang Juu-en, Administrator

Publishing Directors
Tsay Ting-Kuei, Lin Ta-hsiung
Ni Shih-piao

Advisors
Chang Hoang-jang; Chang Shen-ho; Chen Chau-teh; Chen Shis-how; Chen Hsiung-wen; Chen Lian-ping; Chen Shean-rong; Fu Shu-chiang; Ho Soon-ching; Horng Yuh-fen; Hsiao Hui-chuan; Huang Wan-chu; Leu Horng-guang; Lu Chiao-song; Pong Sheng-ming; Tung Te-po; Wang Chen-chi; Wang Lung-chic; Wang Pih; Wu Tien-chi; Young Chea-yuan; Yueh Chang-shya

Editor-in-Chief
Roam Gwo-dong

Executive Editors
Y.F. Liang, Chang Shiuan-wu, Hsiao Lee-kuo, Lin Char-hung, Chang Shao-wen, Peter Morehead

Editorial and translation support provided by:
Hui-kuo Consulting, Ltd., Sustainable Earth Network

The EPM has been published monthly since July 1997. The EPM is available on the EPA website at http://cemnt.epa.gov.tw/eng/webezA-3/code/main.asp

For inquiries or subscriptions to the printed version, please contact:

Environmental Policy Monthly
Environmental Protection Administration
Office of Science and Technology Advisors
41, Sec. 1, Jhonghua Rd.,
Taipei, Taiwan, R.O.C.
tel: 886-2-2311-7722, ext. 2207.
fax: 886-2-2311-5486
e-mail: umail@sun.epa.gov.tw

GPN: 2008600068
Contents Copyright 2004.

printed on recycled paper
行政院新聞局出版登記證局版北市誌字第壹陸壹壹號

中華郵政北台字第6128號執照登記為雜誌交寄