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Feature Article

Health Risk Study on Emerging Drinking Water Contaminants

In order to gain a deeper understanding of the possible health risks associated with exposure to endocrine disruptors and emerging contaminants, the EPA drew up a plan and commissioned outside agencies to screen drinking water from various sites and assess it for evidence of emerging contaminants and overall quality. Currently in its fourth year of implementation, the project's database – which is being regularly updated – now contains data on 57 different substances. Toxicity information and test results from drinking water purification plants were processed to draw up a recommended control list for the EPA.

Emerging contaminants, which are also known as contaminants of emerging concern (CECs), commonly refer to pollutants that are not controlled by regulatory standards but are discovered in natural bodies of water, usually as a result of advancements in testing and analysis technology. When CECs reach certain concentrations in the environment, the potential then arises for chemicals and other substances to harm ecosystems and aquatic organisms.

Such substances are not currently included in monitoring and testing programs, but because of

their toxicity, their potential to harm human health, the public attitude toward them, or their frequency of occurrence in different environmental media, they may end up being added to lists of controlled substances. CECs are not necessarily new chemicals as they are often contaminants that have existed in the environment for some time, but their presence has only recently been discovered, or they may have only recently been recognized as harmful.

The array of endocrine disruptors and CECs in the environment includes many different types of chemicals. Although there is wide concern about the

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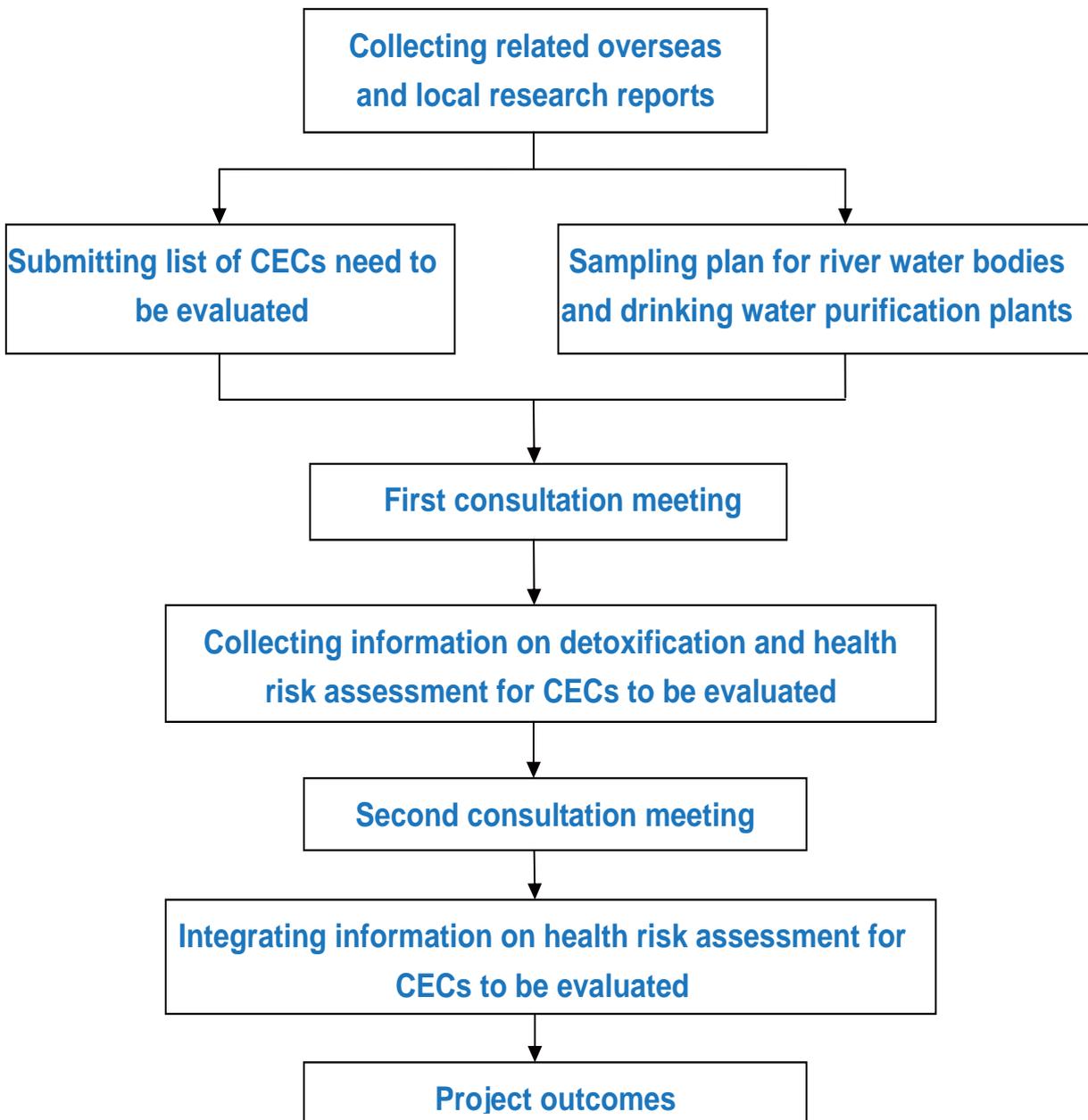
harmful health effects of exposure to environmental hormones and CECs, there is still a dearth of exposure data that can be used to assess possible health risks.

Screening and Assessing Drinking Water for CECs

To gain a better understanding of the problem, the EPA has employed outside agencies to implement a four-year project based on scientific and systematic methodology to screen and assess possible health risks arising from CECs in drinking water. The overall targets for the four years from 2010-2013 include:

1. Formulating scientific and systematic methodology to screen and assess possible health risks arising from CECs in drinking water.

2. The focus of the first and second years was to probe into organic and inorganic substances in effluent from high-tech semi-conductor foundries, optoelectronic material manufacturers, and component manufacturing plants that enter drinking water sources and may pose risks to human health. Overseas and local research reports and standards were referenced to collect information on health risks, testing technology, analyses of frequency of occurrence, and assessments of treatment technologies.



▶ Figure: Health Risk Study on Emerging Drinking Water Contaminants

3. The focus of the third year (2012) was to determine the extent of endocrine disruptors, pharmaceuticals, and personal care products in drinking water sources, and assessing associated health risks.

4. The main objectives for 2013 are to investigate the extent of CECs found in common household products such as surfactants and their residues, plasticizers, etc., in drinking water sources, and to assess associated health risks.

5. Specific recommendations will be given regarding frequency of spontaneous testing for unlisted substances by water companies based on the current feasibility of water purification technologies and testing analyses. Recommendations will also be made regarding short-, medium-, and long-term control strategies for gradually including emerging contaminants into drinking water quality standards.

6. Upon the request of the EPA, provide help collecting health risk information on emerging contaminants associated with emergent events.

When drawing up the watch list of previously unlisted contaminants found during screening and assessment of drinking water, the following factors are taken into consideration:

- The potential toxicity of the contaminant
- Potential exposure assessments (based on amounts produced and chance of exposure)
- Testing and analysis methods
- Whether or not testing data already exists for environmental water bodies and water purification plants
- The efficacy of water purification procedures

Once the watch list of previously unlisted contaminants has been drawn up and the degree of toxicity and environmental distribution have been taken into account, the tasks of collecting information on follow-up detoxification, analyzing water purification plant samples, assessing treatment efficacy, and making trial assessments of health risks can then be carried out. This is followed by consultation meetings

of experts and academics to assess which of the previously unlisted contaminants should be monitored, followed by the task of monitoring them and evaluating the data collected. Further meetings of experts and academics can then take place to discuss the results and draw up a candidate list of the contaminants that should be marked for priority control under the *Drinking Water Quality Standards*. The list will then be passed on to the EPA.

Problem of Residual PPCPs in Environment Gradually Garnering Attention

Implementation of the project is currently in its fourth year and to date the following tasks have been completed:

1st Year (2010) – A list of 37 pollutants discharged by high-tech industries was drawn up, along with a basic toxicity information database for a candidate list of currently unlisted CECs found in effluent from high-tech industries.

2nd Year (2011) – The aforementioned database was regularly updated and information on toxicity/biological effect was added. Additional data on contaminant distribution in the environment and other information was collected. By the end of the year, the database contained updated information on 38 different substances that was then applied to water quality testing in water purification plants. The results were used to draw up the recommended control list for the EPA.

At the same time, after consulting the US EPA Contaminant Candidate List selection procedure, the 38 CECs that were recommended for addition to the watch list of previously unlisted polluting substances included the following 10 pollutants: thallium, gallium, platinum, tetra-methyl ammonium hydroxide (TMAH), nonylphenol (NP), bis-(2-ethylhexyl) phthalate (DEHP), perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS), di-n-octyl phthalate (DOP), and nonylphenol polyethoxylate (NPnEO). These pollutants all have the high toxicity of Class 1 or Class 2 toxic substances, and have been the focus of concern from the EU and the general public. All of these contaminants have also been found in river water, high-tech industry effluent, and water purification plants intakes in Taiwan.

3rd Year (2012) –The focus was on assessing pharmaceuticals and personal care products (PPCPs). These are at the root of public concern about CECs since they are used in large quantities by both human beings and for raising livestock. Seventeen pharmaceutical products, including antipyretic analgesics, antibiotics, hormones and drugs with similar functions, sunscreen, insect repellents, cosmetics and supplements, were selected for the toxicology database. Triclosan and atrazine were also included in the toxicology database.

Based on the results of health risk assessments and the detections of drugs and personal care products in the effluent, the project suggested that high priority should be given to developing the standard reference methods for acetaminophen, libuprofen, N,N-Diethyl-meta-toluamide (DEET), oxybenzone, methylparaben, ethylparaben and propylparaben. It is also suggested that once the standard reference methods are

established, these seven chemicals can be considered for inclusion on the watch list and to continuously monitor their presence in drinking water and assess the risks they pose to human health.

Studies in recent years have found evidence of residues of different PPCPs in environmental water bodies and even in samples taken for testing from water purification plants. This gives rise to the concern that certain PPCPs could enter the drinking water supply system and cause health risks, hence the increasing public attention that the problem of residual PPCPs in different environmental media has garnered in recent years. More research is now being done into testing for residual PPCPs in different environmental media, such as in the air, water, and household dust. Although PPCPs exist in the environment only in minute concentrations, continued exposure to them can lead to chronic exposure problems and the potential for health risks.

Toxic Substance

Review of Amendments to Toxic Substance Control Act Sets Stage for Registration of New Chemicals

In order to promote the establishment of a working system for registering and managing sources of toxic chemicals, on 10 January 2013 the Legislative Yuan's Social Welfare and Environmental Hygiene Committee gave preliminary approval to partial amendments of a draft bill of the *Toxic Chemical Substances Control Act*, paving the way for the registration system to be codified in law.

At present, Taiwan does not have a system for registering toxic chemical sources. The recent amendments thus stipulate the types of chemicals – and corresponding minimum volumes – for which local manufacturers or importers must submit reports to the EPA. These reports must cover the circumstances of manufacture/import, and assessments of physical/chemical composition, toxicity, exposure, and potential hazards to health. The listed toxic chemicals will only be allowed to be manufactured/imported once review and registration have been completed by the EPA. Establishing a system for registering toxic chemical sources, and creating an associated database, will allow the EPA a better understanding of information related to toxic chemicals regarding composition, toxicity, exposure, unusual characteristics, and potential

hazards to health, as well as how they are being used in Taiwan. The EPA is in the process of drawing up a set of management regulations for the registration system that will also cover information disclosure and registration of nanomaterials.

At present, the management of toxic chemicals is split between a number of government departments. Each department controls such chemicals on the basis of how they are used and what is known about their toxicity, within the limits of its own jurisdiction. The latest amendment will give each department access to the information stored in the EPA's toxic chemical registration database, allowing it to assess whether or not to tighten restrictions on toxic chemicals or improve management by establishing toxic substance profiles. Details of the above revisions have been

published on the following EPA Web site for public perusal: <http://ivy5.epa.gov.tw/epalaw/index.aspx>.

Toxic Substance

Arsenic Pentoxide and Three Other Toxic Chemicals to be Controlled

The EPA has made revisions to the announced list of controlled toxic chemicals. Four chemicals – arsenic pentoxide, molybdate red, lead sulfochromate yellow, and tris (2-chloroethyl) phosphate – will join the list and make the total number of controlled toxic chemicals stand at 302. In addition, diisobutyl phthalate (DIBP) will go from being classified as Class 4 to being classified as both a Class 1 and Class 2 chemical.

The impetus for the latest amendment is that these five chemicals have been added to the 2nd batch of substances facing authorization under the EU REACH regulations. REACH regulations stipulate that a permit is required to handle all 2nd batch substances by the middle of 2015, and Taiwan is continuously upgrading and adjusting its management of listed toxic chemicals in order to keep in step with regulatory changes overseas. The EPA has also announced that, from 1 February 2013, the manufacture of asbestos tiles will no longer be permitted. However, manufacturers who obtain a permit before 2 February 2012 will be allowed – by

the principle of legitimate expectation – to continue manufacturing asbestos tiles until their permit expires.

The *Administrative Procedures Act* has been followed regarding the adjustments and new additions to the list of toxic chemicals, with the pre-announcement of a draft and the holding of public hearings and expert consultations. Details of the above regulations have been published on the following EPA Web site for public viewing: <http://ivy5.epa.gov.tw/epalaw/index.aspx>.



▶ Hsiehho Thermal Power Plant in Keelung

Amendments to Air Pollutant Emissions Standards for Electricity Generation Facilities Preannounced

After taking a close look at overseas control standards, domestic emission circumstances, feasible control techniques, and the results of cost-benefit analyses, the EPA has drawn up a draft of revisions to the *Air Pollutant Emissions Standards for Electricity Generation Facilities*. The aim of the standards is to further reduce amounts of pollutants in the air.

Implementation of the *Air Pollutant Emissions Standards for Electricity Generation Facilities* came into effect in 1994. However, overseas emission standards for power plants has been gradually tightening and the technology for cleaning up the gases produced as a by-product of electricity generation has also been advancing. Actual emission concentrations from Taiwan's power plants are also all within current standards. The EPA thus decided, after taking a close look at overseas control standards, domestic emission circumstances, feasible control techniques, and the results of cost-benefit analyses, to compose a draft of revisions to the *Air Pollutant Emissions Standards for Electricity Generation Facilities* in order to lower concentrations of fine suspended particles and precursor emissions. The aim of the standards is to further reduce amounts of pollutants in the air.

The main objectives of the revisions are as follows:

1. The introduction of the concept of heat efficiency will see emission standards for cogeneration turbines adjusted to incorporate heat efficiency rates. The US basic standard for new power plants of 36% of generating capacity will be adopted. For cogeneration turbines that achieve a heat efficiency of over 52%, emission standards will be multiplied by 1.4; for cogeneration turbines that achieve a heat efficiency of over 72%, emission standards will be multiplied by two. The overall objective is to encourage power plant operators to raise the heat efficiency of their power generation machinery.

2. In order to encourage the use of cleaner fuels, boiler emission standards for both steam turbines and cogeneration turbines will not differentiate between the fuels used, but will instead adopt single standard values.

3. Particulate matter pollution controls will be both tightened and simplified to further reduce emissions of suspended particulate matter. At the same time, emission standards for precursors such as sulfur oxides and nitrogen oxides will also be made stricter for the same reason.

4. Mercury emission values have been added to address the problem of mercury emissions from thermal power plants.

5. After taking into account overall reductions in plant emissions and the unique nature of power generation operations, separate standards have been added that will apply during the period of starting up and shutting down turbine operations, for emergency or standby turbines, and for periods when pollution prevention equipment is under regular maintenance.

Based upon what is feasible in terms of pollution prevention and emission control requirements, it is estimated that power plant operators will need to invest NT\$4.6 billion in order to upgrade their pollution prevention facilities so that they meet the amended standards.

Environmental Monitoring

EPA Starts Manual Monitoring of Fine Suspended Particles

In May 2012, the EPA announced standards for fine suspended particles stipulating that data from manual monitoring devices is to be the standard reference method. Since 16 January 2013, the EPA has been regularly publishing on its Web site PM_{2.5} data gathered manually from 30 stations around Taiwan.

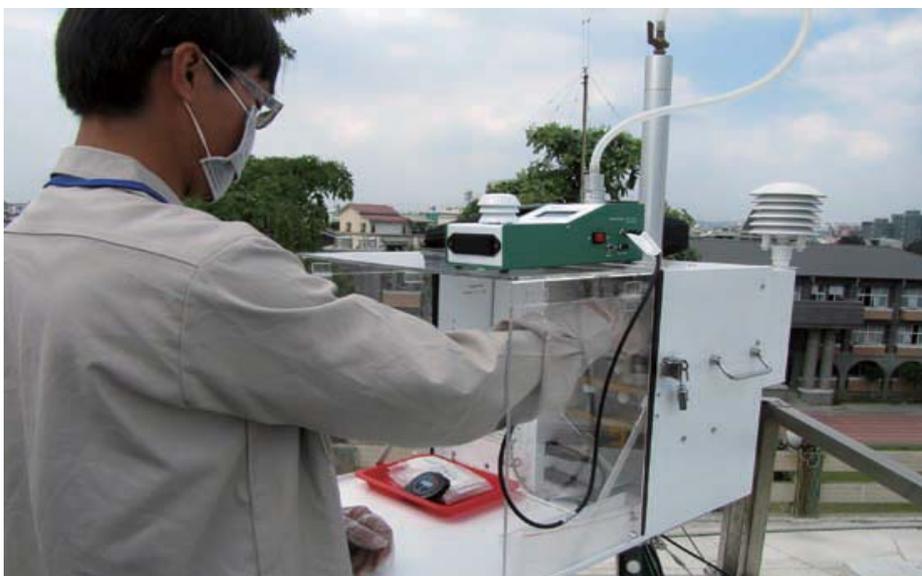
Monitoring of fine suspended particles is a fairly complex procedure that can be done either manually or automatically. The data obtained can vary with the method used or even as a result of the brand of instrument used. The use of manual monitoring data as the standard reference method for air quality standards is generally more common worldwide. In May 2012, the EPA announced standards for fine suspended particles that stipulate that data from manual monitoring is to be the standard reference method.

Since 16 January 2013, the EPA has been regularly publishing on its Web site $PM_{2.5}$ data gathered manually from 30 stations around Taiwan. Sampling is done for a continuous period of 24 hours once every three days. The collected samples are then sent to a laboratory where they are analyzed in a dust-free environment and where quality control protocols are strictly adhered to. It usually takes around 20 days

after samples are taken for the results to be published on the EPA's Web site: www.epa.gov.tw/pm25.

Apart from the US EPA's Federal Equivalence Methods (FEM), no other nation is using automatic monitoring of fine suspended particles as a standard reference method. Automatic monitoring can easily lead to data discrepancies, but since it is capable of giving hourly readings, it is still useful for providing early warnings of pollution conditions. The automatic monitoring instruments that the EPA installed in 2005 are still functioning and the data they provide, once converted into estimated manual monitoring values, are published online. The EPA is presently examining FEM and conducting comparison tests. It is expected that adapted FEM will eventually be adopted in Taiwan as another way of monitoring $PM_{2.5}$ subsidies to stabilize the retail price of LPG to the benefit of dual-fuel vehicle owners.

▶ *Samples are analyzed in a dust-free laboratory*



▶ *Sampler operates manual devices*

Revised Central Taiwan Science Park Phase 4 Development Plan Passes EIA Review

The park authority submitted details of the changes in a document titled Central Taiwan Science Park (Erlin Park) Phase 4 Development Plan Environmental Impact Discrepancy Analysis Report and Results of Evaluations of Proposed Changes.

The proposals were evaluated at the 229th sitting of the EPA's Environmental Impact Assessment Committee on 4 February 2013. During the eight-hour meeting, opinions from members of the public both in favor of and opposed to the Erlin Park were heard. After comprehensive and thorough discussions, the committee finally passed the proposals on the basis of the park authority's decision to switch to low-water consumption/low-carbon emission industries that will have a reduced impact on the environment. A total of eight changes to the original environmental assessment results were approved in the belief that they will reduce the park's environmental burden and reduce the risk of pollution.

In view of the unforeseen difficulties in guaranteeing a long term water supply and the decision by a large optronic manufacturer not to set up in the park, the National Science Council (NSC) proposed that the park authority switch to low-water consumption/low-carbon emission (low-environmental impact) industries. The NSC proposed that Erlin Park switch from being based around optronic and semiconductor manufacturing, as originally planned, to five other industries: precision machinery; integrated circuits (excluding chip manufacturing) and computer peripherals; optronics (excluding flat panel displays); biotech; and alternative energy (excluding LED die manufacturing). This would mean that maximum daily water consumption would fall from 160,000 tonnes to 20,000 tonnes. In addition, the water supply source was switched to the local water system, thereby reducing the daily effluent volume from 120,000 tonnes to 20,000 tonnes. The NSC also applied for seven alterations to the conclusions of the evaluations.

The EPA's Environmental Impact Assessment Committee came to the conclusion that switching to low-water consumption/low carbon emission industries would result in a sizeable drop in daily water consumption and an improvement in the quality of effluent, thus reducing the risk of pollution while

also reducing wastes at the source. The maximum values for effluent from the park will be kept the same as in the original assessment – the strictest in science park history. An amendment has also been added to set the limit for the average monthly concentration of copper in the effluent at 0.1 mg/L.

The Yunlin County Government, concerned that the intensively-farmed flood plains of the Jhuoshuei River downstream from the park could be impacted, has requested that the park authority take responsibility for testing for lead, cadmium, and arsenic in river water directly downstream from the park's deep trench outlets. If the average monthly concentrations of these three metals are found to exceed the maximum values for irrigation water, the effluent discharge limits should be immediately adjusted. The EPA has estimated that as a result of the reductions in effluent pollutants and water consumption, the total amount of pollutants discharged from the park would be less than one eighth of the pre-revision amount. This lowering of the environmental burden was the main reason the proposals were passed. The EPA committee also passed the eight revisions to the original environmental assessment based on the same criteria.



► An irrigation intake at Jhuoshuei River downstream from the science park

Eleven Enterprises Sign Packaging Reduction Agreement with EPA

A total of eleven enterprises-- electronics, agriculture, and design – have signed an agreement with the EPA to reduce the amount of packaging they use. It is estimated that this will result in a reduction of 1,100 tonnes of packaging waste from 14 different products over the coming year.

The eleven enterprises are: Chunghwa Picture Tubes Ltd., AU Optronics Corp., Innolux Corp., BenQ Corp., ASUSTek Computer Corp., and BriView Corp. from the electrical and electronic sector; Huai lang Industries Ltd., Hsin Tung Yang Corp., Puerh Chang's Ltd., and SunnyBright Ltd. from the agricultural sector; and Siang Sin Industrial Co. Ltd. from the design sector. They all signed the agreement to reduce the amount of packaging they use, and their voluntary actions are a shining example of how companies can care for the environment while still pursuing commercial profit.

The EPA has been promoting restrictions on over-packaging since 2006, particularly targeting the multi-

layered gift boxes often used for retailing five major categories of product: cakes and cookies; processed foods; liquor; cosmetics; and computer software. The EPA estimates that this has resulted in an annual reduction of 7,300 tonnes of packaging. In 2010, the EPA signed agreements with packaging designers and local manufacturers of electronic panels, portable computers, household products, which has resulted in a packaging reduction of 6,730 tonnes from 2010-2012. Following on the success with electrical and electronic manufacturers, in 2013 the EPA began offering packaging reduction guidance to the agricultural, food retailing, food processing, and design sectors in order to save resources and protect the environment by reducing excess packaging.

Environmental Inspection

In-depth Inspections – Environmental Protection the Sherlock Holmes Way

The EPA is continuously upgrading its inspector training programs so that inspectors in the field have an effective array of techniques at their disposal in the fight against environmental violations. Violations can often be hard to prove – cases of foot-dragging and cover ups are numerous – and so EPA inspectors have to be as observant and determined as Sherlock Holmes in order to get the sort of cast-iron proof that makes violators admit their guilt.

The EPA's Bureau of Environmental Inspection's Northern Branch was involved in the investigation of a waste water violation case in Taoyuan County. It took the Branch ten separate visits – day and night – to gather all the evidence. The inspectors had to open the manhole covers for the factory's rainwater drains to check on rainwater flow, use tracer fluid and ping pong balls to verify the flow direction of wastewater, and even put on fisherman's waders and breathing apparatus to enable them to inspect deep drains in person, before discovering a hidden pipe used at nighttime to discharge the factory's wastewater.

At another factory, the Bureau of Environmental Inspection's Northern Branch determined that the wastewater was not being treated properly and suspected that it was being diluted and then discharged illegally. Since the wastewater discharge outlet was set in a nearby riverbank, the team used high-power binoculars to watch the outlet from a distance while also taking samples to compare with river water samples. Working in close coordination from inside and outside the factory, and by referring to on-site and aerial photos, the team finally discovered that the factory operator was using strong oxidizing agents to alter the test results and using groundwater

to dilute the wastewater. The inspectors also discovered that the factory operator had installed a hidden valve in the drainage system. When presented with the evidence, the operator had no choice but to admit to breaking the law.

The EPA would like to emphasize that although some factory operators may devise cunning ploys to circumvent environmental restrictions, they will

eventually get caught by dedicated EPA inspectors who are well-trained and equipped with the latest detection technologies. For example, the EPA has employed unmanned aerial vehicles to conduct aerial image recording that can be used to track illegal activity. The EPA is urging all factory operators to fully respect environmental regulations and help to maintain a clean living environment for all.



▶ Inspectors wearing fisherman's waders and breathing apparatus enter a drainage channel



▶ Unmanned aerial vehicles (UAV) used to track illegal activity

Environmental Inspection

EPA, Prosecutors, and Environmental Police Join Forces to Break Sludge Dumping Ring

On the night of 17 January 2013, a task force of over 100 personnel from the EPA, Taichung District Prosecutors Office, and the Environmental Protection Police Corps, conducted searches and inspections and gathered evidence that proved that Da-Xin International Co. Ltd., of Xingfeng, Hsinchu County, had illegally dumped polluted sludge in Beipu, Hsinchu County.

The joint operation resulted in 29 people being detained, along with the confiscation of nine large tractors and two excavators. Nine trucks – eight of them empty and one carrying a load – were pulled over at the dump site, and all nine drivers admitted that the sludge they were transporting had been taken from a polluted sludge pile owned by Da-Xin Co. and dumped directly into pits dug at the site. Earth was then used to cover the pits to avoid detection by environmental inspectors.

Da-Xin Co. is registered as a Grade B waste disposal operator that is licensed to dry and treat industrial sludge so that it can be reused as soil conditioner, land filler, low strength concrete additive, brick and tile additive, and fuel additive. The EPA inspectors,

prosecutors, and environmental protection police officers first got wind in September 2012 that Da-Xin Co. had long been involved in the hiring of illegal operators to arrange for trucks to dump their industrial sludge without treatment. Since this was a clear example of organized crime, the law-enforcement agencies spent some months to monitor the company's activities and gather information on the transportation methods and dumping site before making their move.

During inspections carried out by EPA personnel, it was discovered that Da-Xin Co. was not properly treating the waste that they were receiving and that their air and water pollution prevention facilities were not functioning properly. The company was thus

in violation of Article 24 of the *Air Pollution Control Act*, Article 18 of the *Water Pollution Control Act*, and Articles 31, 36, 42, 46, 47, and 48 of the *Waste Disposal Act*. Causing environmental pollution through

not suitably treating waste, and submitting false reports to the government, are both criminal acts. clearly a win-win situation.



▶ Eight trucks were caught at an illegal dumping site



▶ The illegal sludge dumping site in Beipu, Hsinchu County

Solid Waste

CCTV Mandatory in All Waste Disposal Facilities

In order to make the management of waste disposal enterprises more comprehensive and also to solve a number of operational problems, the EPA has decided to make revisions to the *Permit Management Regulations for Public or Private Waste Clearance and Disposal Organizations* (公民營廢棄物清除處理機構許可管理辦法).

The EPA's thorough review and subsequent revisions of the *Permit Management Regulations for Public or Private Waste Clearance and Disposal Organizations* follow a number of serious environmental incidents, such as large-scale illegal dumping and the case of industrial copper sulfate being discovered in livestock feed. Tighter controls over waste disposal operators and more careful management are seen as the best ways to prevent similar illegal incidents from occurring. The revisions primarily stipulate that waste disposal operators must install closed circuit television (CCTV) systems on their premises. Also added are strict regulations governing the positioning of cameras, storing of recorded material, and protocols in the case of equipment malfunction.

Waste disposal operators will also be required to indicate the intended use of the product. Furthermore, in order to assist inspectors in tracking down illegal gains from unlawful waste clearance and/or disposal, waste disposal operators will be required to submit legally-binding declarations of self-discipline. Other items that can be employed to enforce stricter management – such as cancellation of disposal/clearance permits; clarification of permit evaluation and issuance (denial) deadlines; limitations on the validity of permits to establish new clearance and disposal organizations; and clarification of regulations governing permit revocation and permanent cancellation – have also been revised.

The EPA would like to stress that the revisions to the

management regulations will make the management of waste disposal enterprises more thorough, and will also solve a number of operational problems.

The EPA is urging all waste disposal operators to immediately install CCTV systems in accordance with the regulations in order to avoid violations.

News Briefs

Recycling Food Waste to Generate Power for Households

The EPA has been examining ways to integrate food waste disposal into its development plans for renewable energy sources. To this end, on 1 February 2013, the EPA held the Seminar on Anaerobic Digestion Treatment Techniques. Mr. Edwin Khew, chairman of the Sustainable Energy Association of Singapore, was invited to talk about his country's sustainable energy policies, related techniques currently being employed there, and new developments in the field of bioenergy. Mr. Khew then joined in fruitful discussions and exchanges with delegates of central and local environmental agencies and enterprises involved in bioenergy production.

EPA Deputy Minister Shin-Cheng Yeh also gave a speech at the seminar in which he pointed out that recycling food waste to produce bioenergy is the right direction to be moving in as it also enhances pollution prevention and is consonant with the government's policies of fostering a sustainable society with zero waste.

EPA Holds Flea Market to Raise Money for Charity

On 1 February, the EPA held a flea market-cum-charity auction to coincide with the custom of spring cleaning before Chinese New Year. EPA personnel brought in unwanted items still in good condition for sale and auction. This year's auction was expanded to include the charity organization Catholic Kuang Jen Social Welfare Foundation, recycling operators Da Fon Environmental Technology Co., Ltd., and agencies of the Taipei City and New Taipei City governments. The money raised

by the flea market-cum-charity auction was all donated to charity organizations. EPA Minister Stephen Shu-hung Shen welcomed members of the public to hunt out a bargain or two while personally demonstrating that a bit of light spring cleaning can both help the environment and benefit those in need.

The flea market-cum-charity auction is one of a number of resource recycling activities being given priority as part of the EPA's promotion of the Low-carbon Sustainable Homeland Program. This year will see the implementation of low-carbon sustainability accreditation schemes and implementation projects, and flea markets/barter fairs will also be held at various locations around Taiwan.



▶ The flea market-cum-charity auction held by the EPA

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