

Annex 3.4 Result of the Survey on Waste Reuse/Recycling/Treatment Companies

No.	Prov.	DIW Factory Registration	Industrial wastes handled		Remark	
			Non-HW	HW		
Waste Shops						
1	Samut Prakan	Metal Product (064)	Iron scrap: 200 thous. t/year		Average price of iron scrap: 4 baht/kg	
			Iron scrap: After cutting, crushing and pressing, they send it to electrical furnace smelter		Capital: 60 Mill.baht, Employee: 182	
2	Pathum Thani	Not registered as the factory	Total: 300 t/year		Sorting by hand	
			Wood waste (Wood pallet) 25%, Waste paper 30%, Waste plastic 10%, others 35%.		Capital: 0.5 Mill.baht, Employee: 17	
					They are also transporter of non-HW.	
					They transport non-HW to the landfill of Pathum Thani province.	
					Disposal fee of this landfill: 200 baht/t	
3	BKK	Metal Product (064)	Scrap Copper Scrap Aluminum Scrap Iron and stainless steel Scrap plastics	Pb: Solder Dross	Total wastes handled in this company: 1,200 t/y	
4	BKK	Metal Products (064)	Iron scrap: 150 - 200 thous. t/year		There are 10 big waste shops for iron scrap nationwide.	
					70% of iron scrap: Electrical furnace smelter for making construction material	
					30 % of iron scrap: Cast iron (Engine of automobile parts etc.)	
5	Nonthaburi	Not registered as the factory	Waste paper (Carton box, Paper package): 4t/day		Sorted by hand	
			Waste plastics: 1.5t/day		Capital: 0.9 Mill.baht, Number of Employees: 24	
6	Nonthaburi	Not registered as the factory	Waste paper	Pb: Solder Dross	Sorting by hand	
			Waste plastics			They export scrap metals and waste IC parts to China, Singapore
			Scrap metal: Iron and non-ferrous			

			Wooden pallet, IC parts		
7	Samut Prakarn	Metal Products(064)	Waste metal from IC parts etc.: 200 – 250 t/year		
8	Nonthaburi	Not registered as the factory	Waste paper: 200 - 300 t/y	Printed circuit board (PCB): Sent to GENCO	No.1 sales of this company :Non-ferrous metal from IC parts e.g. IC Parts with gold is very expensive. 1,000 - 5,000 baht/kg (Bonding wire and/or point of contact is used Gold.) PCB has the solder at the contact point and is HW. Number of employees: 65
			Waste plastics: 300 t/y		
			Scrap metal: Iron and non-ferrous (Cu, Ni, Ni-alloy, Al, Au, Ag)		
			Wooden pallet		
			IC parts, Electrical parts, Electrical appliances etc.		
9	Samut Prakarn	Not registered as the factory	Waste paper		Sorting by hand
			Waste plastics		
			Scrap metal: Iron and non-ferrous		
			Wooden pallet etc.		
Recyclers					
1	Rayong	FR: Non-ferrous Metal (060)	Aluminum scrap: 1,500 t/month (capacity: 2,500 t/month		Product: Aluminum ingot
					Numbers of big aluminum recycler nationwide: 10
					Total capacity nationwide: 10,000 t/month
					Present amount of recycled aluminum nationwide: 5,000 t/month
					70%: Import, 30%: Domestic collection
2	Samut Sakhon	Chemical Products (042)		Waste (mixed) Thinner: 7,200 drums/year (About 1,100 t/year)	Process: Distillation (100°C, 150°C, 200°C)
					Capital: 10 Mill. baht ; Capacity: 15 - 20 drums/d
					Recycled thinner: 70% domestic use, 30% export
3	Samut Prakarn	Chemical Products (044)	Expandable polystyrene: 200t/month		Capacity: 750 t/month
					Because a considerable amount of styrofoam is export

	n				to China, they cannot collect enough amount of Styrofoam.
					Process: Extruder, Agglomerater
					Price of styrofoam: Average 4 baht/kg
4	Samut Prakarn	Manufacture of Rubber(052)	Waste Bias Tire of Bus & Truck: 6,000 t/year Rubber sheet and rubber powder are sent to rubber product manufacturing company.		Product: Rubber sheet & powder Estimated amount of bias tire generated in Thailand: 60,000 t/y Radial tire of passenger car is hard to recycle in Thailand. Recycle route of waste tire seems to not be well established in Thailand.
Final Users					
1	Nonthaburi	Paper & Paper Product (038)	Recycle paper: 2,200 t/month		Product: White paperboard for packaging box White paperboard has paper layers. (Surface, Middles, Back linings) No bleaching for waste paper (high cost) Back linings: 100% recycle waste paper (usually waste newspaper) is used.
2	Samut Prakarn	Manufacture of Carpet (025)	Waste PET: 100 t/month Necessary amount of PET material is 300 t/month. Another 200 t/month is imported from the parent company in Japan The use rate of recycled PET as the raw material is 100% in this company.		Product: Taft Carpet Estimated amount of PET collected in Thailand: 3,000 t/month Recently, a considerable amount of PET generated in Thailand is exported to China
3	Pathum Thani	Glass Product (054)	Cullet: 8 - 10 t/month		Product: Glass bottle Capacity of Cullet separation plant: For flint glass, 200 t/y, For amber glass, 400 t/y Only cullet separation plant in Thailand.

Figures in brackets () are Factory Codes.

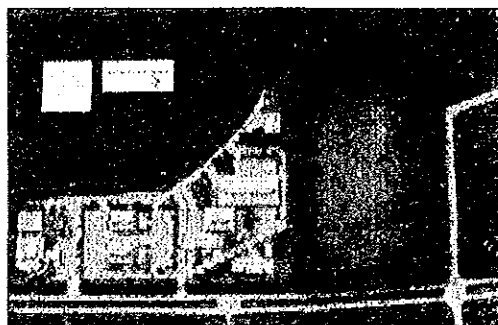
Annex 3.5 Treatment/Final Disposal Facilities for Hazardous Waste and/or Non-Hazardous Waste

1. Facilities for Hazardous Waste	
Factory Code 101 (Central Waste Treatment Plant)	8 Facilities
Factory Code 105 (Sorting and/or Landfilling)	1 Facility
Factory Code 106 (Recycling)	2 Facilities
2. Facilities for Non Hazardous Waste	
Factory Code 101 (Central Waste Treatment Plant)	6 Facilities
Factory Code 105 (Sorting and/or Landfilling)	2 Facilities
Factory Code 106 (Recycling)	1 Facility

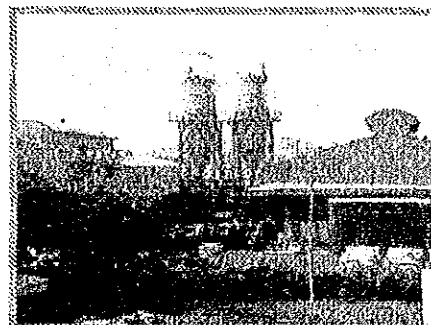
Factory Code 101 (Central Waste Treatment Plant) --- Hazardous Waste ---

HW101-1/8

Factory	GENCO Map Ta Phut Facility
Factory Code	101
Service	Treatment of all types of industrial hazardous waste
Design Capacity	<ul style="list-style-type: none"> • Fuel blending of waste oil and waste solvent for cement industry 200 ton/day
(Actual Amount in Parenthesis)	<ul style="list-style-type: none"> • Sludge stabilization 600 ton/day • Landfill 500 ton/year
Address	5 Maptaphut Industrial Estate, Muangmai Mabtaput Sai 6 RD. Muang District, Rayong 21000
Contact person	Mr. Sripop Sarasas (Chief Executive Officer) Mr. Tanong Promma (Public Relations Manager)
Tel	0-2651-8812-22
Fax.	0-2651-8832-33
Note (Visited in June 2002)	<ul style="list-style-type: none"> • Located in the Map Ta Phut Industrial Estates directly under IEAT. • A new landfill site is under construction within the same estate (area: 85 rai (13.6 ha), to be operated from December 2002) and facilities for sludge stabilization and the recycle of batteries, IC parts, etc. are planned in the same plot of land.



Layout of the Map Ta Phut Plant



Sludge Stabilization Facility



New Landfill under Construction

Factory Code 101 (Central Waste Treatment Plant)

--- Hazardous Waste ---

HW101-2/8

Factory	GENCO Samae Dum Treatment Plant (GENCO rents from DIW)
Factory Code	101
Service	Treatment for non-organic industrial waste
Design Capacity (Actual Amount in Parenthesis)	<ul style="list-style-type: none"> • Wastewater treatment (110,000 ton/year) • Sludge stabilization (30,000 ton/year)
Address	Soi. Wat Samae Dum Samae Dum Sub-District, Bangkuntien, Bangkok 10150
Contact person	Mr. Amornsak Benchaplaporn (General Manager)
Tel	0-2415-3728
Fax	0-2415-3817
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • The facility owned by DIW and operated by GENCO, a sub-contractor. • After stabilized, sludge is disposed of at the Ratchaburi landfill of DIW. • The wastewater treatment facility mainly receives waste from the plating industry, dying industry and textile industry.



Samae Dum



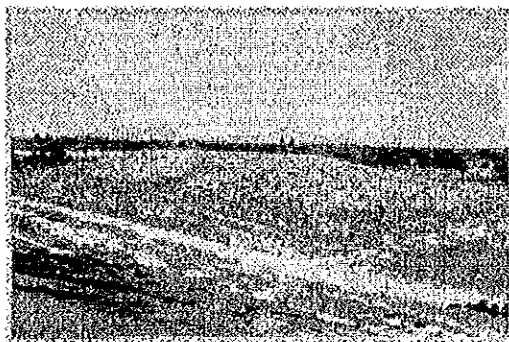
Wastewater Treatment Facility

Factory Code 101 (Central Waste Treatment Plant)

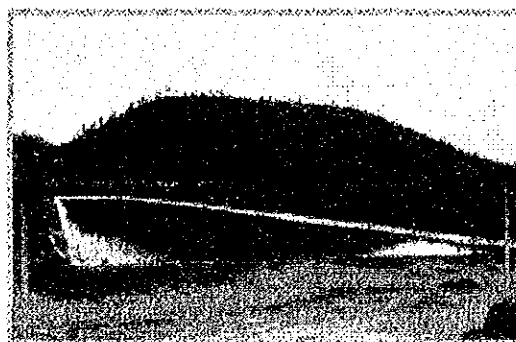
--- Hazardous Waste ---

HW101-3/8

Factory	GENCO Rachaburi Industrial Waste Treatment Facility Landfill
Factory Code	101
Service	Central waste treatment (landfilling waste or unusable materials)
Design Capacity (Actual Amount in Parenthesis)	(30,000 ton/year, Sludge stabilized at the DIW Samac Dum Center) Total landfill capacity: approximately 1 million tons)
Address	Rachaburi
Contact person	Mr. Chanwut Hawwattanapanitch
Tel	0-1830-2564
Fax	---
Notes (Visited in May 2002)	<ul style="list-style-type: none"> • The facility owned by DIW and operated by GENCO, a sub-contractor. • Area total: 48 ha, area of landfilling: 24 ha. • As of the end of May 2002, the second cell is finished and landfilling at the third cell started. The first cell has been already covered with soil. The second cell has not been covered yet since the efficient use of land between the second and third cells is under consideration. • The landfill will be expanded to 96 ha (adjacent land already purchased).



Landfill



Leachate Treatment Facility

Factory Code 101 (Central Waste Treatment Plant)

--- Hazardous Waste ---

HW101-4/8

Factory	Techno Chem. Co., Ltd.
Factory Code	101
Service	Recycling (Solvent)
Design Capacity (Actual Amount in Parenthesis)	• Organic solvent recycling 15,000 ton/year (4,000 ton/year)
Address	70/2 Suwintawong Rd. Moo 7 Muang District, Chachoengsao 24000
Tel	0-2373-0028
Fax.	0-2373-1457
Notes	The team has been requesting the visit, but it is not yet accepted as of June 14, 2002.

Factory Code 101 (Central Waste Treatment Plant) --- Hazardous Waste ---

HW101-5/8

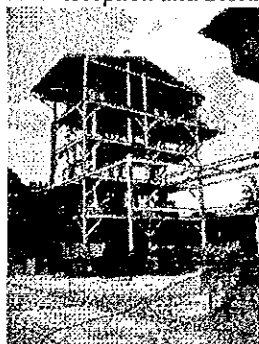
Factory	Recycle Engineering Co., Ltd.		
Factory Code	101		
Service	Recycling and Improving solvent and chemicals for - Cleaning Solvent - Solvents Refrigerants - Hydrocarbon/Mixed - Halogenated Hydrocarbon		
Design Capacity (Actual Amount in Parenthesis)	• Solvent recycling	10,000 ton/year (4,000 ton/year)	
Address	57 Moo 7 Chareon Chockdee Rd. Tambon Taboonme, Choburi 20240		
Contact person	Mr. Patikan Mahuttanaraks (Managing Director)		
Tel	0-2749-8522-3,		
Fax.	0-2749-8973		
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • Also carries out fuel blending for the cement industry. • Clients spread all over the country. • Purchases waste solvent at 500 ~ 800 Bahts/drum. 		



Waste Solvent Reception and Storage Facility



Waste Solvent Distillation Facility



Waste Solvent Fractionating Facility

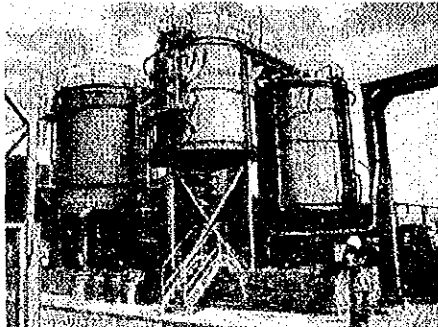


Storage of Samples of Collected Solvent

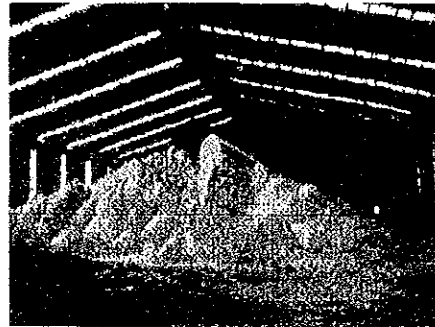
Factory Code 101 (Central Waste Treatment Plant) --- Hazardous Waste ---

HW101-6/8

Factory	Siam Cement Industry (Kaengkoi) Co., Ltd.
Factory Code	101
Service	Disposal of hazardous waste that can be used as alternative fuel or raw materials
Design Capacity (Actual Amount in Parenthesis)	<ul style="list-style-type: none"> • Liquid waste treatment (used as (20,000 ton, Jan – Sep, 2001) alternative fuel) • Solid waste treatment (used as (26,000 ton, Jan – Sep, 2001) alternative raw material)
Address	33/1 Friendship Rd. Moo 3 Kaengkoi District, Saraburi 18260
Contact person	Mr. Pipope Siripatananont (Director, Engineering Division) Mr. Suwat Tuppavong (Energy Manager)
Tel	0-2586-5670
Fax.	0-2586-3098
Notes (Visited in July 2002)	<ul style="list-style-type: none"> • A fuel blending facility is installed (operated by Sita-Thai). • A tire feeder is installed and being tested.



Waste Oil Blending Facility



Sludge Storage Facility



Tire Feeder for Testing

Factory Code 101 (Central Waste Treatment Plant) --- Hazardous Waste ---

HW101-7/8

Hazardous Wastes	
Factory	Siam City Cement Industry Co., Ltd.
Factory Code	101
Service	Disposal of hazardous waste that can be used as alternative fuel or raw materials
Design Capacity (Actual Amount in Parenthesis)	<ul style="list-style-type: none"> • Total waste accepted (192,029 ton, Jan – Apr, 2002) • Waste oil (241 ton, Jan – Apr, 2002) • Wax oil (610 ton, Jan – Apr, 2002) • Carbon/Resin/Mold (142 ton, Jan – Apr, 2002) • Fly ash (133,133 ton, Jan – Apr, 2002)
Address	99 Saraburi Factory Moo 9 Friendship Rd. km.129, Kaengkoi District, Saraburi 18260
Contact person	Mr. Choompon Lertchuwongsa
Tel	0-3635-7180, 0-3635-7155 Ext. 4151
Fax.	0-3635-7181, 0-3622-1931
Mobile	66-1927-5296
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • Test started in the beginning of this year. The promotion of waste business has just started. • A waste oil blending facility is installed.




Waste Blending Facility



Solid Waste Feeder

Factory Code 101 (Central Waste Treatment Plant)
--- Hazardous Waste ---

HW101-8/8

Factory	Professional Waste Technology (1999) Co., Ltd.
Factory Code	101 and 105
Service	Central waste treatment (sorting and landfilling waste or unusable materials)
Design Capacity (Actual Amount in Parenthesis)	The facility is under construction.
Address	234 Moo 4, Tambol Makkaeng, Wattanakorn District, Sakaew 27160
Contact person	Mr. Shane Aimpoolsub
Tel	0-2246-7372-3
Fax.	0-2246-4149
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • Facilities for waste landfill and waste recycling are planned. • It is located three-hour drive from Bangkok. • Landfills for Non-HW and HW are currently being prepared. • Total area available is 3,000 rai and a waste recycling facility is also planned. • Non-HW will be accepted for landfilling from July 2002. • HW will be accepted for landfilling from the end of the year 2002.
	
<p>Non-HW Landfill under Construction</p>	

Factory Code 105 (Waste Sorting and/or Landfilling)
--- Hazardous Waste ---

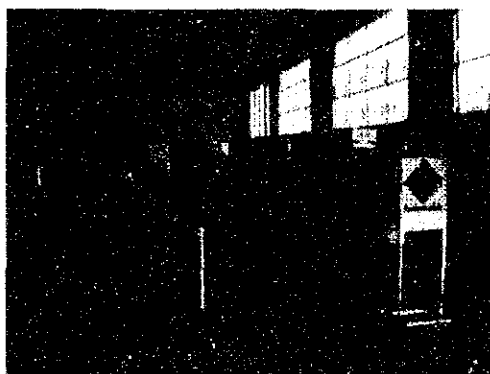
HW105-1/1

Factory	Waste Technology (1999) Co., Ltd.
Factory Code	101 and 105
Service	Central waste treatment (sorting and landfilling waste or unusable materials)
Capacity	The facility is under construction.
Address	234 Moo 4, Tambol, Makaeng, Wattanakorn District, Sakaew 27160
Contact person	Mr. Shane Aimpoolsub
Tel	0-2246-7372-3
Fax	0-2246-4149
Notes (Visited in June 2002)	<ul style="list-style-type: none">• Facilities for waste landfill and waste recycling are planned.• HW and Non-HW will be accepted.• Refer to the previous table of the same company.

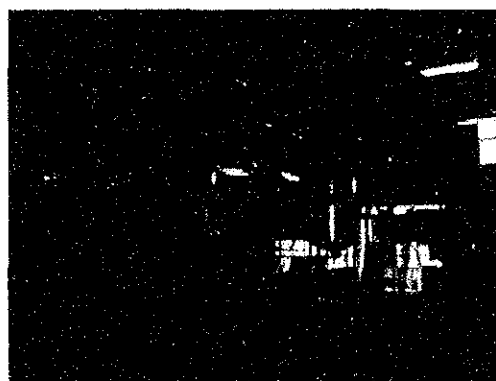
Factory Code 106 (Recycling)
--- Hazardous Waste ---

HW106-1/2

Factory	Refine Tech Co., Ltd.
Factory Code	106
Service	Treatment, disposal, and recycling for deteriorated or used chemicals and all waste
Design Capacity (Actual Amount in Parenthesis)	5m ³ /day
Address	47 Moo 7 Soi Suksawad 76, Suksawad Rd., Prapadaeng District, Samutprakarn
Contact person	Mr. Somchai Auttavoothisilpa (Technical Service Manager)
Tel	0-2817-8568-9
Fax	0-2817-8569
Mobile	01-9362678
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • At present, it is specialized in the recycling of IPA (Isopropyl Alcohol). • Waste IPA is received without payment.



Waste IPA Reception and Storage Facility

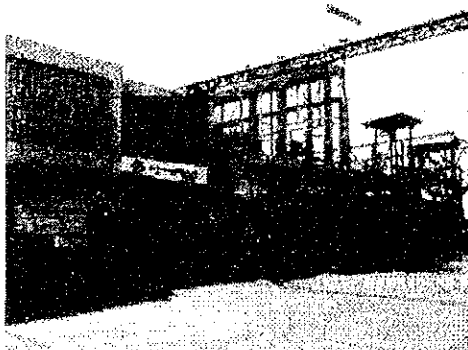


IPA Distillation Facility

Factory Code 106 (Recycling)
--- Hazardous Waste ---

HW106-2/2

Factory	Asian PVS Chemical Co., Ltd.
Factory Code	42 and 106
Service	Produce ferric chloride for water treatment by using unusable industrial produce or waste
Design Capacity (Actual Amount in Parenthesis)	3,000 ton/month (1,000 ton/month)
Address	85/1 Moo 5, Bangna-Trad Rd. Bangpakong District, Chacheungsao 24180
Contact person	Ms. Karen Wiebelhaus (General Manager)
Tel	(66-38) 570-155, (66-38) 570-705, (66-1)617-8583, (66-1) 617-7310
Fax	(66-38) 570-441
Mobile	01-833-7043
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • It oxidizes wastewater containing iron chloride $FeCl_2$ and recovers iron chloride $FeCl_3$. • Recovered $FeCl_3$ is exported to be used for water treatment. • It may reject waste containing foreign substances. • Iron scrap is used as iron supplement. • $FeCl_3$ recovery had been operated before the attainment of Code 106.



Office Building and Wastewater Treatment Facility



In Front of Wastewater Treatment Facility

Factory Code 101 (Central Waste Treatment Plant)

--- Non-Hazardous Waste ---

Non-HW101-1/6

Factory	Better World Green Co., Ltd.
Factory Code	101
Service	Non-HIW disposal service (Landfilling)
Address	15/1 Moo 5 Tambon Tha Mapang, Kaeng Koi District, Saraburi 18110
Design Capacity	20,000m ³ (Total landfill capacity)
Tel	0-2731-1125
Fax.	0-2731-2574
Notes	The team has been requesting the visit, but it is not yet accepted as of June 27, 2002.

Factory Code 101 (Central Waste Treatment Plant)

--- Non-Hazardous Waste ---

Non-HW101-2/6

Factory	Exhaust Co., Ltd.
Factory Code	101
Service	Non-HIW disposal service (Incineration)
Capacity	The factory was registered, but is not yet constructed.
Address	Bangphee-Tamru Rosd, Tambon Bangpoo Mai, Muang District, Samut Prakarn
Contact person	---
Tel	---
Fax.	---
Notes (Interviewed over the telephone)	• It obtained a license before constructing the facility.

Factory Code 101 (Central Waste Treatment Plant)

---- Non-Hazardous Waste ----

Non-HW101-3/6

Factory	Banpan Engineering and Holding Co., Ltd.
Factory Code	101
Service	Non-IIIW disposal service (Incineration)
Design Capacity (Actual Amount in Parenthesis)	(7 ton/day (14 hour/day), Waste amount incinerated) Design capacity of the furnace 500 kg/hour
Address	Moo 9, Samkok-Sena Road, Tambon Bangnomko, Sena District, Ayudhaya
Contact person	Mr. Pongsathon Phansaeng (Green Area And Flower Garden Management)
Tel	2921641-3, 2912661, 2912388
Fax.	2921644
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • It is located in the Banpan Industry Park. • It currently receives burnable waste generated from shoe factories in the park. • It will receive burnable waste from outside of the park. • A new incinerator is planned in the adjacent plot of land.



Truck Scale



Waste Incinerator

Factory Code 101 (Central Waste Treatment Plant)
--- Non-Hazardous Waste ---

Non-HIW101-4/6

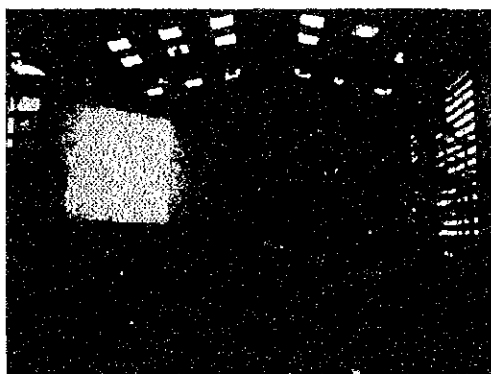
Factory	Rojjana Industrial Park Pcl.
Factory Code	101
Service	Non-HIW disposal service (Incineration)
Capacity	The incinerator is out of order and the operation has been stopped.
Address	1 Moo 5 Rojana Road, Tambon Kanham, U-Thai District, Ayudhaya
Contact person	Mr. Suwat
Tel	0-3533-0000-10
Fax.	---
Notes (Interviewed over the telephone)	<ul style="list-style-type: none">• At present waste is transferred to the public landfill in Pathum Thani for final disposal.• When the operation will restart is not decided.

Factory Code 101 (Central Waste Treatment Plant)

--- Non-Hazardous Waste ---

Non-IIW101-5/6

Factory	SIL Industrial Lands
Factory Code	101
Service	Non-HIW disposal service (Incineration)
Design Capacity (Actual Amount in Parenthesis)	200 tons/month (200 m ³ /month) Two incinerators
Address	Nong Plakradee, Tambon Bua-Loy, Nongkae District, Saraburi
Contact person	Mr. Pittaya Phetcharoen (SIL Industrial Land Assistant Manager)
Tel	0-3637-3333-5
Fax	0-3637-3226
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • It is located in the industrial estate operated by the Siam Cement Group. • It incinerates burnable waste from the estate. • It also accepts burnable waste from outside of the estate.



Incinerator



Ash Disposal Site

Factory Code 101 (Central Waste Treatment Plant)
--- Non-Hazardous Waste ---

Non-HW101-6/6

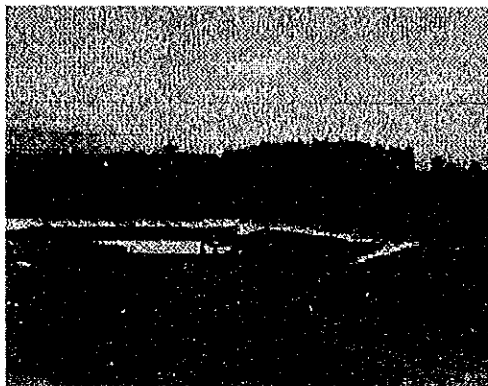
Factory	Rayong Industrial Lands Co., Ltd.
Factory Code	101
Service	Non-HIW disposal service (incineration)
Design Capacity (Actual Amount in Parenthesis)	60 ton/month (4 ton/8 hrs)
Address	Tambon Nongbua, Bankhai Distric, Rayong 21120
Contact person	Mr. Passakorn
Tel	0-3889-2222-3
Fax.	0-3889-2224
Notes (Interviewed over the telephone)	<ul style="list-style-type: none">• The Siam Cement Group is the 100% share holder• It incinerates waste from offices.

Factory Code 105 (Sorting and/or Landfilling)

--- Non-Hazardous Waste ---

Non-HW105-1/2

Factory	Eastern Seaboard Environmental Complex Co., Ltd. (ESBEC)	
Factory Code	105	
Service	Non-HIW disposal service (Landfilling)	
Design Capacity (Actual Amount in Parenthesis)	2,500 ton/day (150 ton/day)	
Address	88 Moo 8 Tambon Bo-Win, Sriracha District Chonburi	
Contact person	Mr. Anant Thamrakkid (Senior Sales Representative) Mr. Suchintana Viraratt (Sales and Customer Service Manager)	
Tel	0-3834-6364-7	
Fax	0-3834-6368	
Notes (Visited in June 2002)	<ul style="list-style-type: none"> • It is located in the Chonburi Industrial Estate under the IEAT. • The current total area is 75 rai (12 ha), but the expansion to the adjacent land is planned. • A recycling facility will be constructed in future. • It will also apply for the license of HW landfill. • The structure of the landfill is good enough to receive HW. 	



Landfill



Leachate Treatment Facility

Factory Code 105 (Sorting and/or Landfilling)

--- Non-Hazardous Waste ---

Non-IIW105-2/2

Factory	Professional Waste Technology (1999) Co., Ltd.
Factory Code	101 and 105
Service	Central waste treatment (sorting and landfilling waste or unusable materials)
Capacity	The facility is under construction.
Address	234 Moo 4, Tambol, Makaeng, Wattanakorn District, Sakaew 27160
Contact person	Mr. Shane Aimpoolsab
Tel	0-2246-7372-3
Fax.	0-2246-4149
Notes (Visited in June 2002)	<ul style="list-style-type: none">• Facilities for waste landfill and waste recycling are planned.• HW and Non-HW will be accepted.• Refer to the previous table of the same company.

Factory Code 106 (Recycling)
--- Non-Hazardous Waste ---

Non-HW106-1/1

Factory	Technology Environmental Management Co., Ltd.
Factory Code	106
Service	Municipal non-hazardous waste recycling
Capacity	The facility is under construction.
Address	Moo 1 Tambon Khao Mai-Kaen, Kabinburi District, Prachinburi 25110
Contact person	---
Tel	0-2246-8275-6
Fax	0-2247-6963
Notes (Interviewed over the telephone)	• Operation will start in the year 2003.

Annex 3.6 Survey Sheet for Public Opinion Survey on Environment and Industrial Waste Management In Bangkok and its Surrounding Area

Sample No.: _____

Name of Interviewer: _____

Name of Respondent: _____

Address of Respondent: _____

Phone number: _____

Date of Interview: _____

Starting time: _____ Finishing time: _____

Name of Editor: _____

Date of Editing: _____

Instruction to Interviewer

Please select the number/numbers of the provided answer/answers and put it/them into the box/boxed at the end of each question.

Before asking about industrial waste and its management, I would like to ask your opinion about general environment issues.

1. About General Environment Issues

Q.1. First of all, I ask you about current problems, including economic and social problems, in Thailand. What do you think the most serious problem is in the Thai society now? What is the second serious problem? Please mark 1 and 2 respectively.

- 01. Pollution problems
- 02. Economic Stagnation or recession
- 03. Drug problems
- 04. Unemployment
- 05. Corruption
- 06. Poverty problems
- 07. Political instability
- 08. Family problems
- 09. I do not know.
- 10. Others (Please specify: _____)
- 99. No response

1-1 The most serious problem

1-2 The second serious problem

Q.2.2-1 Are you interested in environment issues?

- 1. Yes → Go to Question 2-2
- 2. Yes, but a little → Go to Question 2-2
- 3. No
- 9. No response

2-2 If you are interested in environment issues, how do you get information on environment issues? Please select the two biggest sources of information among the following choices.

- 01. TV news
- 02. Radio News
- 03. Newspaper
- 04. Magazine/Journal
- 05. Official bulletin
- 06. New letter published by NGO
- 07. Internet
- 08. Family/Friends
- 09. Residents' association
- 10. Other (please specify : _____)
- 11. I do not know
- 99. No response

2-1 Are you interested in environment issues?

2-2 The sources of information

Q.3. How do you think about current situations of the following environment problems?
Please select one in each of the following environment problems.

1. ...not serious at all
2. ...not very serious
3. ...somewhat serious
4. ...very serious
5. Can't choose
9. No response

- 3-1 Air pollution
- 3-2 Water pollution
- 3-3 Solid Waste
- 3-4 Noise
- 3-5 Deforestation
- 3-6 Flood
- 3-7 Climate Change
- 3-8 Others

Q.4. How much do you feel environmental degradation affect your life?

1. It dose not affect at all.
2. It affects to some degree.
3. It causes serious problems.
4. I do not know.
5. Others (Please specify: _____).
9. No response

4.

Q.5. Which is more important for you, Economic Development or Environment Conservation?

1. Economic development is more important.
2. Economic development is somewhat more important.
3. Economic development is as important as environment conservation.
4. Environment conservation is somewhat more important.
5. Environment conservation is more important.
6. Can't chose.
9. No response.

5.

Q.6. Do you agree to pay more tax for the environmental conservation?

1. Strongly agree.
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree.
5. Strongly disagree.
6. Can't choose.
7. Others (Please specify: _____)
9. No response.

6.

Q.7.

7-1 Do you try to save water and energy consumption in your daily life?

1. I always try to save water and energy. → Go to Q.7-2
2. I sometimes try to save water and energy. → Go to Q.7-2
3. I do not care about saving water and energy.
4. Others (Please specify: _____)
9. No response.

7-2 (only to those who chose 1 or 2 in the Q.7-1) If yes, what is the reason why to save water and energy consumption?

1. It is for economic reason.
2. It is for environment concern.
3. It is both for economic and environment reason.
4. Others (Please specify: _____)
9. No response

7-1

7-2

Q.8. What do you think the main pollutant source is for the following pollution problems?
Please answer in each pollution problem. Please select the biggest pollutant source.

Source of Pollutants							
1. Air pollution	1. Industries	2. Automobile	3. Household	4. Construction	5. Others (Specify:)	6. I do not know	9. No response
2. Water Pollution	1. Industries	2. Household	3. Agriculture	4. Livestock	5. Others (Specify:)	6. I do not know	9. No response
3. Solid Waste	1. Industries	2. Household	3. Livestock	4. Agriculture	5. Others (Specify:)	6. I do not know	9. No response
4. Noise	1. Industries	2. Construction	3. Transportation	4. Amusement business (karaoke)	5. Others (Specify:)	6. I do not know	9. No response

8-1 Air pollution In the case of answer 5. Specify: _____

8-2 Water Pollution In the case of answer 5. Specify: _____

8-3 Solid Waste In the case of answer 5. Specify: _____

8-4 Noise In the case of answer 5. Specify: _____

Q.9. Please consider how reliable of each following organization can be, then select the number and put in the providing boxes.

1. I trust
2. I somewhat trust
3. I do not trust much
4. I can't trust
5. I do not know
9. No response

9-1 News media

9-2 Central Government

9-3 Local government

9-4 Residents' association

9-5 Mayor/Chief of District

9-6 Member of Parliament

9-7 Thai NGO

9-9 International NGO
9-9 Others (Specify: _____)

What is local government?

For those who are living in the Bangkok metropolitan area, it is Bangkok Metropolitan Administration, BMA. For those who are living outside Bangkok, it is municipal government.

What is NGO?

NGO is an abbreviation of Non Government Organization. The organization is usually established by citizens for non-profit purpose to achieve specific goals: to support poor people; to solve environment problems; to promote awareness of AIDS; and so on. NGOs can be divided into 2 groups: Thai NGOs established by Thai people such as Thailand Environment Institute and International NGOs based in developed countries such as Green Pease and Care International.

Q.10. Do you think that environmental regulations are observed?

1. Yes, they are observed.
2. They are somewhat observed.
3. They are not observed much. → Go to Q.11
4. They are seldom or never observed. → Go to Q.11
5. I do not know.
9. No response.

10.

Q.11. What kind of measures do you think should be taken to make regulations observed?

Please select the most effective measure you think. (Please select one)

1. The Thai government tightens control and increase penalty.
2. Industries should take pollution control measures more seriously.
3. People should pay more attention to environment issues.
4. I do not know
5. Others (Please specify: _____)
9. No response/

11.

Q.12. What do you think the Thai government should do to improve environment? Please select up to 3 among the following choices.

01. To establish new laws and regulations.
02. To tighten its control and increase penalty.
03. To construct more waste water/waste treatment facilities.
04. To construct reuse/recycle center.
05. To help industries improve pollution control capabilities.
06. To have more programs to develop new technology.
07. To promote environment education.
08. To speed up decentralization.
09. To promote participation of local people.
10. To open more information and data.
11. I do not know.
99. No response.

12.

2. About industrial waste and its management

In this section, I will ask you about industrial waste and its management. First of all, I would like to know how much do you know about industrial wastes. When a factory produces something, that process always generates wastes, and we call it industrial wastes. For example, raw materials are packed by corrugated cartons, wooden boxes, or plastic bags. All of them become industrial wastes, after raw materials are used. At the machine and car producing factories, a lot of iron scrap is generated. It is also industrial waste. To use machine at factories, oil and grease are used and they become industrial wastes after being used for a certain period. Like this, there are many kinds of industrial wastes.

(1) Current situations of industrial waste and its management

Q.13. Have you ever heard about industrial waste?

1. I often heard.
2. I sometimes head.
3. I rarely heard. Go to Q.18 after Q.14
4. I've never heard. Go to Q.18 after Q.14
9. No response. Go to Q.18 after Q.14

13.

Q.14. What kind of image do you have about industrial waste?

1. It is hazardous and should be treated carefully.
2. It causes environmental pollution.
3. It is the result of our economic developments.
4. I have no idea.
5. Other (please specify: _____)
9. No response

14.

Q.15. (To those who answered 1 or 2 in Q.13) Do you know what industrial waste is like?
Do you know anything which categorized as industrial waste?

1. Yes, I know it very well
2. Yes I know it a little
3. No, I do not know it well
4. No, I have no idea.
9. No response

15.

Q.16. (To those who answered 1 or 2 in Q.13) There are various steps to manage and treat industrial waste. Do you know about the process of industrial waste management?

1. Yes, I know it well. → Go to Q.17
2. Yes, I know it a little. → Go to Q.17
3. I have heard of it, but I do not know well.
4. No, I have no idea.
9. No response

16.

Q.17. What kind of process of industrial waste management do you know? Please check all that you know, among the following choices.

Instruction:

*When it comes to the term "to know", it means that respondent have concrete images of the process.

1. Production management to hold down the creation of industrial waste.
2. Transportation of industrial waste.
3. Storage of industrial waste
4. Reuse, recycle and recovery of industrial waste..
5. (Intermediate) Treatment.
6. Disposal (landfill) of industrial waste
7. Other (please specify : _____)

17.

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Q.18. There are many facilities, which treat and dispose of industrial waste in Bangkok and its vicinity, including municipal waste treatment/disposal facilities that accept industrial waste. What image do you have about industrial waste treatment and disposal facilities?

1. They are operated and maintained properly.
2. They are not operated properly and cause minor problems.
3. They are not operated properly and cause serious problems.
4. I do not know.
5. Other (please specify : _____)
9. No response.

18.

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Q.19. Recently, newspaper and TV news sometimes make a report about industrial wastes and problems caused by industrial wastes. Please select all that you know among the following problems.

01. The volume of industrial waste is increasing.
02. A lot of industrial wastes are dumped illegally in inappropriate places.
03. There are not enough waste treatment/disposal facilities in Thailand.
04. Factories and business establishments that produce industrial waste don't treat waste properly, or don't pay enough to treat waste.
05. Industrial wastes are often treated improperly at treatment/disposal facilities.
06. The Thai government does not monitor waste treatment/disposal facilities properly.
07. Illegal dumping of industrial waste and inappropriate management of treatment/disposal facilities causes pollution problems such as soil and ground water contamination.
08. There are a lot of disputes between the government and local people, concerning project plans to construct waste treatment/disposal facilities throughout Thailand.
09. I do not know.
10. Others (please specify: _____)
99. No response

19.

(2) Appropriate waste management and countermeasures to solve problems caused by industrial waste

Here I would like to ask your opinion what kinds of measures should be taken to cope with the following issues; Illegal Dumping of waste; Industrial waste treatment and disposal facilities; Waste minimization, Cost of industrial waste management and those who bear the cost; Establishment of industrial waste treatment/disposal facilities.

1) Illegal Dumping

Q.20. How much do you feel illegal dumping of industrial waste affect environment?

1. It dose not affect at all.
2. It affects to some degree. → Go to Q.21
3. It causes serious problems. → Go to Q.21
4. I do not know.
9. No response.

20.

Q.21. What do you think the most effective solution to illegal dumping of industrial waste?
How about the second effective solution?

1. To tighten its control and increase penalty by the government.
2. To organize a monitoring group by local people.
3. To construct more waste treatment/disposal facilities.
4. To encourage industries to reduce the volume of waste.
5. To promote environment education.
6. I do not know.
7. Other (please specify : _____)
9. No response.

21-1. The most effective solution

21-2. The second effective solution

2) Industrial waste treatment and disposal facilities

Q.22. Recently the Thai government makes a plan to construct new industrial waste treatment/disposal facilities to cope with the increase in the volume of industrial waste. What do you think about construction of new industrial waste treatment/disposal facilities?

1. It is urgent issues to construct new waste treatment/disposal facilities in Thailand.
2. It is necessary to construct new facilities, but the government should modify current policies and measures, before considering the construction of new facilities.
→ Go to Q. 23
3. There are not enough facilities, but it is not necessary to construct new facilities. There are alternatives such as waste minimization by promoting reuse/recycle of waste.
4. There are enough facilities and no need to construct new facilities.
6. I do no know.
5. Other (please specify: _____)
9. No response.

22.

Q.23. (to the person who chose 2 in the Q.22) What kind of measures do you think the government should take, before considering the construction of new waste treatment/disposal facilities? Please select up to 3 among the following choices.

01. To open and explain its long and short term plans to the public plainly.

02. To guarantee the participation of local people in the planning process.
03. To guarantee that the environment impact assessment survey is carried out thoroughly.
04. To encourage IW treatment/disposal facilities to conclude an agreement with local people in order to guarantee an appropriate operation and maintenance.
05. To tighten its control, such as monitoring and inspection of industrial waste treatment/disposal facilities, to guarantee an appropriate operation and maintenance.
06. To support industrial waste treatment/disposal facilities to improve their capabilities.
07. To tighten its control of illegal dumping of industrial waste and increase penalty.
08. To promote environment education.
09. To promote the reduction of waste generation by improving production process.
10. To promote the reduction of industrial waste discharged from factories by reuse/recycle of waste.
11. I do not know.
12. Other (please specify: _____)
99. No response.

23.

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Q.24. What do you think reasons why there are so many disputes over construction plan of industrial waste treatment/disposal facilities are? Please select up to 3 among the following choices.

1. The government policies are not clear.
2. The planning itself is incomplete from technical point of view.
3. The planning process is distorted by corruption.
4. Local people cannot participate in the planning process.
5. The procedure of project is not appropriate, and the environment impact assessment survey is not carried out properly.
6. Local people are worried about pollution by leakage or emission of toxic substances form facilities.
7. Local people don't believe that the government can monitor treatment /disposal facilities properly.
8. The government cannot persuade local people the importance or indispensability of waste treatment/disposal facilities.
9. Local people are worried that waste treatment/disposal facilities could lower the value of their real estate.
10. Local people are seeking higher compensation.
11. I do not know.
12. Other (please specify : _____)
99. No response.

24.

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3) Waste minimization

Q.25. Have you ever heard about measures, such as reuse or recycle of waste, to reduce the volume of industrial waste generated in factories?

1. I often heard (Go to Q.26)
2. I sometimes head (Go to Q.26)
3. I rarely heard
4. I've never heard
9. No response.

25.

--

Q.26. What kinds of measures are they? Please select all measures you know.

Instruction:

*When it comes to the term "to know", it means that respondent have concrete images of the process.

1. Reuse of waste (to use the waste again, without processing, or only with simple treatment; using a used bottle after rinsing.)
2. Recycle of waste (to use the waste again as raw material, including energy source, with chemical, physical, and/or biological processing.)
3. Improvement of production process to reduce waste generation.
4. Other (please specify: _____)
9. No response

26.

Q.27. Do you know any government programs to promote industrial waste minimization?

1. I often heard (Go to Q.28)
2. I sometimes head (Go to Q.28)
3. I rarely heard
4. I've never heard
9. No response

27.

Q.28. How did you get information on these government programs?

1. TV news, radio news, or newspaper.
2. Official bulletin
3. Internet
4. Family/Friends
5. Other (please specify : _____)
9. No response

28.

4) Cost of industrial waste management and those who bear the cost

Q.29. Do you think that industry pay enough attentions and bear the enough cost to treat /dispose of industrial waste?

1. Strongly agree.
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree.
5. Strongly disagree.
6. Can't choose.
7. Others (Please specify: _____)
9. No response.

29.

Q.30. If appropriate waste management ends up with the rise of production cost and its price, are you willing to buy the goods at higher prices?

1. Very willing
2. Fairly willing
3. Neither willing or unwilling
4. Fairly unwilling
5. Very unwilling

37.

Q.38. What is your occupation?

(Instruction to Interviewer: Let the respondent answer freely, and classify the answer according to the following occupation classifies table.)

01. To engage in agriculture, forestry or fishery.
02. Self employed or working for family business
03. Employee of service industry
04. Skilled worker;
05. General labor
06. Office clerk or employee with technical skills;
07. Manager or executive.
08. Profession.
09. Housewife
10. Student
11. Unemployed
12. Others (please specify : _____)
99. No response

Occupation Classified Table

No.	Title	Example of occupations
1		(1) Farmer, (2) fishery, (3) forester
2	Self employed	(1) Those who is involved in commerce, manufacturing, or service industry, and the number of employee is less than 9, (2) Those who are working for family business
3	Employee of service industry	(1) Salesclerk of shop, department store, or supermarket; (2) salesperson; (3) employee of service industries such as restaurant, hotel and so on; and (4) housekeeper, caretaker of apartment and so on.
4	Skilled worker	(1) Factory worker with special skills; (2) site foreman; (3) employed craftsman; and (4) fire fighter, and so on
5	General labor	(1) Unskilled worker, (2) manual labor, (3) general labor, (4) janitor, and so on.
6	Office clerk or employee with technical skills	(1) office clerk or engineer of private company, public corporation, and government office; (2) people working for an educational institution, such as teacher, lecturer and assistance of university; (3) medical staff such as nurse, pharmacist, midwife, and technician; and (4) expert of transportation industry such as aerial navigator and navigation officer.
7	Manager or executive	Manager or executive of company, public corporation and government office
8	Profession	(1) Lawyer, (2) doctor, (3) accountant, (4) professor or researcher, and so on

38.

Q.39. How many persons are there in your family and how many persons are making money? I am sorry to ask you about personal issue, but how much is total income of your family per month?

39-1

Number of family member in total

39-2

Number of family who are working

39-3

- Total income
1. Less than 5,000 T.H.B./month
 2. 5,000 - 9,999 T.H.B./month
 3. 10,000 - 19,999 T.H.B./month
 4. 20,000 - 29,999 T.H.B./month
 5. 30,000 - 49,999 T.H.B./month
 6. More than 50,000 T.H.B./month
 9. No response

39-1 Family number in total

39-2 Number of family who are working

39-3 Total income

Q.40. How many years do you dwell in present premises? If you moved to the current place less than 5 years ago, where are you from?

1. Less than 5 years → from which province? _____
2. 5 - 9 years
3. 10 - 19 years
4. 20 years or more
9. No response

40.

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Q.41. Please check all that you have in your house among the following items.

- 1 Car
2. Motorbike
3. TV
4. Video deck
- 5 Telephone (or Cellular phone)
6. Air conditioner
7. Refrigerator
8. Washing machine

41.

Q.42. Do you read newspaper daily?

1. Yes, I read newspaper every day.
2. I sometimes read newspaper.
3. I rarely read newspaper.
4. Others (Please specify : _____)
9. No response

42.

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----- Thank you very much!! -----