CIIU Code	Classification of Industries for the Study	CIIU Code	Classification of Industries for the Study
	OTHER MANUFACTURE INDUSTRIES		**ELECTRICITY, GAS AND WATER**
39011	Manufacture of jewellery (excluding customer jewellery which for into 39099)	41011	Generation, transmission and distribution of electric energy
39012	Manufacture of silverware		
39021	Manufacture of musical instruments		**RETAIL TRADE**
39031	Manufacture of sporting, athletic and camping goods	62536	Gasoline filling stations (sale of petrol, lubricants, car wash service, greasing service, etc.)
39091	Manufacture of toys		
39092	Manufacture of umbrellas and canes		**PERSONAL AND HOUSEHOLD SERVICES**
39093	Manufacture of pencils, pencil holders, pens and similar articles	95201	Laundries and dry cleaners
39094	Manufacture of lamp shades		
39095	Manufacture of brooms and brushes		
39099	Manufacture of buttons, hair wigs, custom novelties and other articles not elsewhere classified		

C.3 Classification of Wastes for the Study

a. Viewpoints of Classification

aa. MODE-1: Easiness in classifying by visual inspection

Classification in which inspected wastes are to be determined to belong to a certain category visually. (In principle, both the management and generators of ISW should be able to determine the category to which the inspected wastes belong.)

e.g. - solid waste
- sludge
- liquid waste
- waste in powder state

ab. MODE-2: Classification easily corresponding to disposal stages (i.e. storage, transport, treatment and final disposal)

Classification which correlate with technology in respective disposal stages.

Storage: Necessity of "container" and "anti-explosive measures", prohibition of "mixture"

Transport: Transport mode (e.g. tanker lorry, tipper lorry, container tipper, in

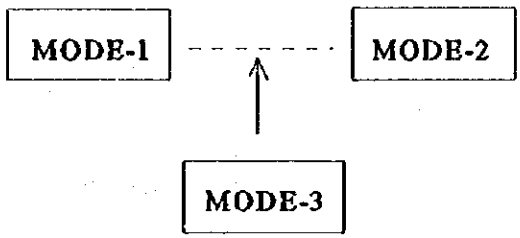
drums, etc.), leakage, explosion, secondary environmental pollution
Treatment: Crushing, sorting, incinerating, melting, composting, etc.
Final disposal: Decomposability, necessity of leachate treatment, hazardousness.

ac. MODE-3: Classification which enables easier judgement of hazardousness, explosiveness and reusability

- Classification that hazardousness, explosiveness, ignitability, hydroreactivity, environmental toxicity of wastes are understandable to who treat the wastes.
- Classification which easily enables recycling and/or resource recovery from waste.

b. Classification System

ba. System in Japan



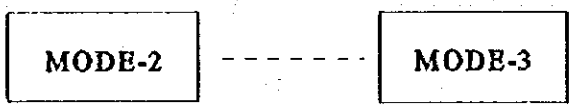
Features:

- Waste classification in Japan essentially states that the classification should be such that both the waste generator (or their qualified personnel) and relative government authorities (or their responsible personnel) could mutually understand waste classification with ease.
- This classification system has an advantage for identifying the optimum treatment methods in accordance with the generated amount of categorized wastes.
- Although this classification system is not well established in terms of hazardous waste identification (MODE-3), it is complemented by

designating hazardous wastes by sources and/or content of hazardous or toxic substances.

- However, there are some problems in classification system in Japan, such as exclusion of solvents in MODE-1.

bb. System applied in the EWI's RISNOR Study



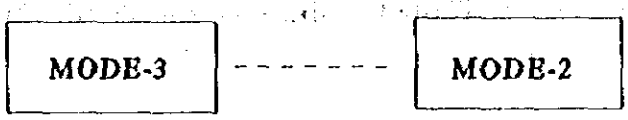
Features:

- Classification system of EWI basically is same as that in Japan. It should be such that both waste generators and relative administrative authorities could mutually understand ISW classification with ease.
- Industrial wastes are classified into 333 categories and also by its hazardousness and reusability as in MODE-3.

bc. Other Systems

Features:

The combination of MODE-3 and MODE-2 is waste administrator oriented. If the present state of waste generation is clarified according to this classification, it will be the best for fully managing industrial waste. However, this type of classification is very complex and difficult for waste managers of factories and field inspectors from the administrative side to apply.



Features:

The combination of MODE-3 and MODE-1, which is similar to Japanese classification, is easy to be applied because waste category is built based on the difference that can be identified only by visual inspection. Due to the difficulties of hazardous wastes identification, however, it requires skilled capabilities of factory managers as well as field inspectors from the administrative side.

bd. Advantages and Disadvantages

There are following advantages and disadvantages in each system:

- Although the classification applied in Japan is not able to completely manage and identify hazardous wastes, it make it possible for administrators and waste managers in factories to categorize their wastes even if their capabilities are limited.
- The classification of EWI study which SESMA-PROCEFF plans to adopt officially for their ISW monitoring and management (i.e. CDSI system) should be currently most suited to the present state of industries in the region. As proved in the EWI's RISNOR study, the 333 classification is most suited for management of the declaration (and is advantageous especially in view that both waste generator and authority could identify ISW), however, diversity in the 333 classification is of great disadvantage and imposes a huge restraint when estimating total waste generation amount in the MR and for planning treatment/disposal plans based upon the estimated value.
- The classifications applied in Europe and USA are superior to that in Japan regarding hazardous waste management, especially the classification of **MODE-3 — MODE-1** has compatibility with Japanese classification. However, classification requires high level of analysis capability and knowledge on chemicals for both administrators and waste managers in factories.

c. Determination of Waste Classification and Priority Waste for the Study Priority

The method of criteria determination of ISW for the Factories' Survey was the principle issue. The Study Team carried out an examination with regard to this issue, its outcome was materialized for the following discussions between the Team and the Chilean counterpart.

i. 24 classification of ISW

Following the examination of the criteria used by Japan, EU and the World Bank, the Team found that the EU's classification of industrial waste is based upon physico-chemical characteristics, however, the capacity to conduct detailed laboratory analysis is required. Meanwhile, initially in building the framework of management system of ISW, it is important that field staff of both industrial waste generators and relevant governmental authorities could visually identify waste characteristics. In view of this, waste classifications of the World Bank and Japan were examined and the 24 classification (as shown in Table C.3a) of ISW was proposed.

Table C.3a ISW Classification (24 Categories) Used for Factories' Survey

ISW Code	ISW category
C-1	Ash including from incinerator
C-2	Dust and APC products
C-3	Inorganic sludge
C-4	Organic sludge
C-5	Asbestos
C-6	Acids
C-7	Alkalis
C-8	Solvents
C-9	Oily waste
C-10	Inorganic chemical residues
C-11	Organic chemical residues
C-12	Other liquid waste
C-13	Waste from food production
C-14	Glass and ceramics
C-15	Metal and scrap
C-16	Paper and cardboard
C-17	Plastics
C-18	Rubber
C-19	Textile and leather
C-20	Waste similar to domestic waste
C-21	Wood
C-22	Slag from melting
C-23	Construction waste
C-24	Other solid waste

ii. EWI's 333 classification of ISW

The counterpart approved the classification proposed. However, at the same time requested that attentions should be drawn to the 333 classification (which had been proposed through EWI's RISNOR study and is being incorporated into SESMA-PROCEFF's control system of the declaration system) and the compatibility of 24 classification and 333 classification with each other.

iii. Matrix-table for 24 and 386 classifications

The Study Team confirmed the request and formulated a matrix-table which indicates the correspondence between both the 24-classification and the 333 classification. Furthermore, this matrix-table is incorporated into the Team's Factories' Survey. Meanwhile, the Team proposed that some items of ISW which were classified into non-hazardous waste according to SESMA-PROCEFF's current waste categories should be changed into categories of hazardous

As a consequence of the above discussions, it was confirmed that the Team's survey of "Actual Condition of Industrial Solid Waste" should employ a matrix-table in which principal 24 classifications are vertically listed and correspondence with waste codes being employed by SESMA-PROCEFF are maintained (see Table C.3b).

On the other hand, EWTs RISNOR investigation considerably clarified the status-quo of non-hazardous industrial waste. Both the Team and Chilean counterpart mutually understood that the ISWM in the Metropolitan Region will have to be mainly targeted to "Hazardous Waste" including "Liquid waste" and the Study's survey should mainly focus on these wastes.

d. Format of Survey Questionnaire Form

In relation to the main objectives of the survey (such as, identification and understanding of on-going generation, control/disposal, re-utilization of ISW on-site, factories' management, organization of ISW, analyses of on-going treatment of effluent gas and waste water and understanding of factories' strategies for industrial solid waste), a draft survey form was produced by the Team. As a consequence of discussions between the Chilean counterpart and the Team and after several pilot surveys were conducted and reexamination of the draft survey form, final survey form was produced. (This form is attached to Data Book A.1).

Table C.3b Matrix-table of Waste Classification for the Factories' Survey

		Non-hazardous	Hazardous	Liquid
C-1	Ash including that from incinerators	49 153	138 209 266	
C-2	Dust and * APC Products	101 125 126	264	
C-3	In-organic sludge	82 84 87 95 97 189	86 88 89 93 94 141 221 222 224 227 228 250 254 262 263 269	
C-4	Organic Sludge	76 81 85 90 91 92 95 100 129	83 86 94 141 158 202 219 221 222 223 225 226 250 262 263	
C-5	Asbestos		205	
C-6	Acids		206 211 229 267 270	175 308 309 310 311 312 313 316 373 392
C-7	Alkalis			371 374 385 386
C-8	Solvents		201 213	52 305 326 352 353 356 358 367 386 401 402 403 407 408 409 410
C-9	Oily Waste		67 244	301 302 303 304 329 334 354 357 362 415
C-10	In-organic Chemical Residues	17 18 32 59 103 104 107 108 135 136 159 160 187	3 34 70 105 106 109 173 206 208 214 215 238 249 253 255 256 257 261 272	343 371 375 376 377 378 379 380 381 382 383 384 387 388 389 390 391 392 393 394 395 396 397 398 399 400 416
C-11	Organic Chemical Residues	15 24 38 40 56 65 135 146 174 176	2 3 34 167 204 207 230 231 233 235 236 238 239 240 242 243 245 246 252 253 255 256 257 258 259 261 268	306 314 315 318 319 320 321 322 324 325 328 330 331 332 333 336 337 338 339 341 342 344 345 348 349 359 361 363 364 365 366 369 404 405 406 411 412 413 414
C-12	Other Liquid Wastes			340 351 417
C-13	**Waste From Food Production	39 41 53 63 66 99 132 139 140 147 150 151 156 184 186		317
C-14	Glass and Ceramics	9 43 57 117 148 155 166 170 197		
C-15	Metal Including Scrap	5 12 26 27 28 29 30 71 143 161 171 193 198		
C-16	Paper and Cardboard	19 22 112 113 114		
C-17	Plastics	21 116 118 119 120 121 122 123 124 145 154 164 165 191 192		
C-18	Rubber	64 102		
C-19	Textile and Leather	1 6 45 74 134 149 168 195		
C-20	Waste similar to Domestic Waste	42		
C-21	Wood	44 127 10 98 133 178 179		
C-22	Slag from Melting	152 177	50 51 271	
C-23	Construction Waste	11 14 23 48 68 73 111 169 172 182 190 194 196		
C-24	Other Solid Wastes	13 31 35 47 54 110 115 180 181 183 185 188	16 203 241 247 248 260	

C.4 Selection of Factories for the Survey

C.4.1 Selection Criteria

a. Criteria in view of scale of factory

The selection criteria in view of scales of factory are described below.

I. There were 3,296 manufacturing companies (CIIU Code 3111-3909) in the Metropolitan Region with no less than 10 employees according to the available INE data. Whereas companies with 50 or more employees comprised 1,150 companies and total employees of those companies (1,150) counted for about 80% of all employees of 3,296 companies (see Table C.4.1a and Table C.4.1b).

ii. There are 575 companies with 100 or more employees and whose total employees counted for two-thirds of total employees of companies whose employees are not less than 10 in the Metropolitan Region.

iii. In view of the above, companies even with less than 100 employees which might turn out to be prime generators of hazardous solid waste (e.g. fertilizer/insecticide manufactures) should be scoped up to the scale of more than 49 employees for the selection criteria. Other industries might have to be scoped up to the scale of more than 99 employees considering than they count for two-thirds of total employees and that initial governmental pollution regulations and guidelines could be scoped for larger companies.

iv. Upon consideration of both time and budget limitations for the survey and required number of data for estimation of waste generation (especially that of hazardous wastes), it was necessary to carry out factory surveys up to 200 factories, the selection criteria should be as follows.

- All 55 companies with 500 or more employees (whose total employees comprised 54,000 persons and which counts for 20% of total 270,000 employees of companies whose employees are not less than 10 in the Metropolitan Region)
- 80 companies out of 199 companies with 200 to 499 employees (whose total employees comprised 27,000 persons

and which counted for 10% of total 270,000 employees in the Metropolitan Region)

- 60 companies out of 320 companies with 100 to 199 employees (whose total employees comprised 12,000 persons and which counted for 4% of total 270,000 employees in the Metropolitan Region)

- Other 5 companies (e.g. from industrial code 3512, etc.)

The total 200 companies selected from the above criteria comprise one-third of all 270,000 employees of companies whose employees are not less than 10 in the Metropolitan Region. It should be noted that covering rate is less than this figure, because there are companies who has more than a factory and there are many factories with less than 10 employees.

Table C.4.1a List of Manufacturing Company With 10 or More Employee by INE

Unit : Number of companies

CIIU	Industrial Category	1000 and above	500-999	200-499	100-199	50-99	20-49	10-19	TOTAL
3111	Livestock slaughtering and meat production	0	2	5	10	6	12	9	44
3112	Dairy products	2	0	2	3	3	3	4	17
3113	Fruits, vegetables, and their products	1	0	6	9	8	12	5	41
3114	Fish and other marine foods	0	0	1	1	4	3	3	12
3115	Animal and vegetable oils	0	0	4	3	2	7	1	17
3116	Cereal foods	0	0	1	1	5	11	1	19
3117	Bakery, biscuits, cakes, pastas and the likes	0	3	5	7	25	208	182	430
3119	Cocoa and Chocolate powder and sugar confectioneries	1	0	2	1	2	7	3	16
3121	Other non-classified food manufacturing	0	0	4	6	6	19	9	44
3122	Animal feeds	0	0	1	2	2	4	1	10
3131	Alcoholic distilling	0	0	1	0	1	3	1	6
3132	Wine, ciders and other fermented beverages	1	0	2	6	3	6	2	20
3133	Malt, beer and malt liquors	0	1	1	0	1	0	0	3
3134	Non-alcoholic beverages	0	3	0	0	0	1	0	4
3140	Cigarettes, cigars and tobacco	0	0	0	0	2	0	1	3
3211	Textile processing and materials manufacturing	3	4	14	16	23	59	47	166
3212	Cloth manufacturing and related processing	0	0	0	4	4	20	10	38
3213	Socks, stocking and knit products	0	1	9	10	34	46	37	137
3214	Carpets and rugs	0	0	0	2	1	9	7	19
3215	Ropes, cables, cordage, nets and the likes	0	0	0	0	1	2	0	3
3219	Other non-classified textile industries	0	0	0	0	2	2	1	5
3220	Garment industries	1	4	14	30	67	136	91	343
3231	Leather tanning and finishing	0	0	2	1	9	9	2	23
3232	Fur dressing, dyeing and other fur and skin articles	0	0	0	0	0	0	1	1
3233	Leather products (exc. footwears)	0	0	1	1	2	9	13	26
3240	Leather footwears	2	2	9	14	34	49	33	143
3311	Wood processing and wooden products manufacturing	0	0	1	8	10	31	18	68
3312	Wooden and cane containers manufacturing	0	0	0	0	1	0	1	2
3319	Other non-classified wooden products	0	0	0	1	4	7	5	17
3320	Furniture, fixture and the likes	0	0	5	8	15	34	25	87
3321		0	0	0	0	0	1	0	1
3411	Paper and pulp	0	2	2	0	0	2	3	9
3412	Paper containers and boxes	0	1	4	4	4	8	1	22
3419	Other paper and pulp products	0	3	1	1	7	13	7	32
3420	Printing, photoengraving, publishing and the likes	1	2	6	8	29	55	51	152
3511	Organic and inorganic industrial chemicals	0	0	0	2	3	14	13	32
3512	Fertilizers, insecticides and the likes	0	0	0	0	1	2	1	4
3513	Resins, plastics, and chemical fibres	0	0	0	1	1	2	2	6
3514	Manufactured chemical products	0	0	0	0	3	0	0	3
3521	Paints, Varnishes, lacquers, enamels, and the likes	0	0	3	4	4	6	5	22
3522	Medicines (Pharmaceutical products)	0	2	3	14	15	7	1	42
3523	Soaps, detergents, shampoos, cosmetics, and the likes	0	0	7	8	6	12	9	42
3529	Other non-classified chemical products	1	0	3	5	12	24	16	61
3540	Oil and coal products	0	0	2	2	1	7	1	13
3551	Tyres, tubes, rims and the likes	0	1	1	1	2	7	2	14
3559	Other non-classified rubber products	0	0	2	10	4	8	13	37
3560	Other non-classified plastic products	0	0	12	29	51	89	42	224
3610	Potteries and ceramic products	1	0	4	1	2	7	6	21
3620	Glass and glass products	0	1	2	2	3	4	0	12
3691	Bricks, Lettices, walls and refractory materials	0	0	3	2	4	6	0	15
3692	Cements, lime, and plasters	0	0	1	1	2	1	1	6
3693	Cement building materials	0	0	3	5	5	13	7	33
3695	Fibre cement products	0	1	0	1	1	2	0	5
3696	Plaster building materials	0	0	1	0	1	1	1	4
3699	Other non-metallic mineral products	0	0	1	1	4	8	7	21
3710	Iron and steel industries	0	1	5	7	3	7	2	25
3721	Basic copper industry	0	0	0	1	0	0	0	1
3722	Copper products and alloys	0	1	3	0	2	2	2	10
3729	Basic non-ferrous metal industries (exc. copper)	0	0	0	0	0	3	2	5
3811	Metal cutlery, hand tools and other general hardware	0	0	1	4	6	9	3	23
3812	Metal furniture and fixture	0	0	1	4	3	17	11	38
3813	Metal structures, tanks, shanties, doors and windows	0	0	8	11	20	31	22	92
3814	Metal packages, tools, and household utensils	0	2	8	12	13	17	12	64
3815	Wires, non-isolated cables and by-products	0	0	3	4	1	13	9	30
3819	Other metal products	0	0	4	4	11	44	28	91
3822	Agricultural machinery	0	0	0	0	3	5	0	8
3823	Wood and metal working machinery	0	0	0	0	6	7	4	17
3824	Other industrial machinery	0	0	0	1	4	8	5	18
3825	Office machinery and equipment (inc.computers)	0	0	0	0	0	1	3	4
3829	Other non-classified machinery	2	1	1	10	14	33	20	81
3831	Motors, generators, transformers and the likes	0	0	1	3	2	7	5	18
3832	Radio, TV, X-ray related machinery and equipment	0	0	0	1	3	1	0	5
3833	Electric heating machinery and equipment	0	0	1	0	2	1	0	4
3839	Other electric machinery	0	0	3	5	5	7	8	28
3841	Ship and boatyards, marine engines and their parts	0	0	0	0	1	3	0	4
3842	Railroad machinery and equipment	0	0	2	0	1	0	0	3
3843	Vehicle parts and engines	0	0	5	2	14	20	9	50
3844	Motorcycles and bicycles	0	0	1	0	2	2	1	6
3845	Airplanes and their components	1	0	0	0	0	0	0	1
3849	Other transport equipment	0	0	0	1	0	5	1	7
3851	Measurement, controlling and medical machinery	0	0	0	1	3	8	5	17
3852	Optical and photochemical machinery (inc lens)	0	0	0	2	0	1	1	4
3901	Jewellery and silverware	0	0	1	0	0	0	1	2
3902	Musical instruments	0	0	0	0	1	0	2	3
3903	Sporting, athletic and camping goods	0	0	0	0	0	2	1	3
3909	Other non-classified manufacturing industries	0	0	1	1	9	19	15	45
TOTAL		17	58	200	359	515	1,373	874	3,396

Source : INE

Table C.4.1b Total Employees in the MRS for the Companies with 10 or More Employees by INE

Unit : number of employees

Scale of Company / CIIU CODE		10-19	20-49	50-99	100-199	200-499	500-999	1000 or More	TOTAL
High Potential Industries	3211	705	2,065	1,875	2,400	4,900	3,000	4,500	19,445
	3231	30	315	675	150	700	0	0	1,870
	3319	75	245	300	150	0	0	0	770
	341	165	805	825	750	2,450	4,500	0	9,495
	3420	765	1,925	2,175	1,200	2,100	1,500	1,500	11,165
	351	240	630	600	450	0	0	0	1,920
	352	465	1,715	2,775	4,650	5,600	1,500	1,500	18,205
	354	15	245	75	300	700	0	0	1,335
	355	225	525	450	1,650	1,050	750	0	4,650
	356	630	2,800	3,825	4,350	4,200	0	0	15,805
	362	0	140	225	300	700	750	0	2,115
	3699	105	280	300	150	350	0	0	1,185
	371	30	245	225	1,050	1,750	750	0	4,050
	372	60	175	150	150	1,050	750	0	2,335
	381	1,275	4,585	4,200	5,850	8,750	1,500	0	26,160
	382	480	1,890	2,025	1,650	350	750	3,000	10,145
	383	195	560	900	1,350	1,750	0	0	4,755
	384	165	1,050	1,350	450	2,800	0	1,500	7,315
	385	90	315	225	450	0	0	0	1,080
	390	285	735	750	150	700	0	0	2,620
	Sub-total	6,000	21,245	23,925	27,600	39,900	15,750	12,000	146,420
Less Potential Industries	311	3,120	9,205	4,125	5,250	9,100	3,750	6,000	40,550
	312	150	805	600	1,200	1,750	0	0	4,505
	313	45	350	375	900	1,400	3,000	1,500	7,570
	314	15	0	150	0	0	0	0	165
	3212-3219	825	2,765	3,150	2,400	3,150	750	0	13,040
	322	1,365	4,760	5,025	4,500	4,900	3,000	1,500	25,050
	3232-3233	210	315	150	150	350	0	0	1,175
	324	495	1,715	2,550	2,100	3,150	1,500	3,000	14,510
	3311-3315	285	1,085	825	1,200	350	0	0	3,745
	332	375	1,225	1,125	1,200	1,750	0	0	5,675
	361	90	245	150	150	1,400	0	1,500	3,535
	3691-3696	135	805	975	1,350	2,800	750	0	6,815
	Sub-total	7,110	23,275	19,200	20,400	30,100	12,750	13,500	126,335
Total		13,110	44,520	43,125	48,000	70,000	28,500	25,500	272,755

Note: Total employees are calculated based on the following assumptions

for scale of company	10 - 19 :	15	Employees	200 - 499 :	350	Employees
	23 - 49 :	35	Employees	500 - 999 :	750	Employees
	50 - 99 :	75	Employees	1,000 or More:	1,500	Employees
	100 - 199:	150	Employees			

b. Selection criteria in view of HW generation potentiality

ba. Priority of the survey

Since identification and distinction of HW from other ISW followed by appropriate disposal management are the essential prerequisite for the Master Plan Study of Industrial Solid Waste Management in the Metropolitan Region, both the Chilean side and the Study Team recognize the necessity of "Survey for Actual Conditions of Industrial Waste" with emphasis on surveys to industries with high potentiality of HW generation. EWI's RISNOR study may be useful for analyzing actual conditions of solid waste generation in the Region, it is only an investigation intended for non-HW; the study enables identification and understanding of status-quo regarding non-HW only to a certain degree. In view of the above, selection of factories to be visited should like to prioritize industries with high potentiality of HW generation, with due consideration to factories scoped in the survey of EWI's RISNOR study.

bb. Criteria of in view of hazardousness

The criteria of HW were examined in depth since both the Chilean counterpart (SESMA-PROCEFF) and the Study Team mutually recognized that the criteria of HW are essential for the Study. Consequently, the following aspects were confirmed by both parties.

I. The mode of waste classification in view of easiness by visual inspection proposed by the Study Team (which enables both officers in administrative authorities and managers in waste generating factories to visually identify the appropriate categories of wastes with ease) plays an important role in ISWM (which further corresponds to certain extent to "the mode of waste classification in view of hazardousness" as can be seen in Table C.3b). Hence for the time being, 24 categories of waste in view of easiness in visual judgement were proposed as a principal classification mode for the "survey of actual conditions of industrial waste".

ii. On the other hand, since the mode of waste classification mentioned in the D&M's RISPEL study was not practically applicable to the "Declaration System" of SESMA-PROCEFF, EWI's investigation employed a mode of classification with 333 categories. Relativity between the mode of 24 classification and the EWI's mode of 333 categories had to be examined and established prior to the conduct of the "survey of actual conditions of industrial waste" in order to maintain validity and compatibility between previous investigations and this Study.

iii. As a consequence, the matrix (shown as Table C.3b) between the 333 categories of the above correspond to one of 24 categories, visually was confirmed by both parties. Questionnaire form for the survey of "actual conditions of industrial waste" included a table that waste identified under 24 categories is identified to correspond to the 333 code which SESMA-PROCEFF is being adopted. In this work, the Team proposed to re-classify some of non-hazardous wastes to hazardous wastes.

bc. Industries with High Potentiality of Hazardous Waste Generation

Based on the above criteria, industries (classified in 4 digit CIIU code) which have high potentiality of generating HW were identified through the following manner.

I. Referring to previous and present experiences and actualized investigation surveys of ISWM in Brazil, EU, Japan etc., the Study Team selected categories of industries which are liable to generate HW.

ii. On the other hand, EWI's RISNOR study indicated categories of probable waste (under 333 codes) from each industry (under the 4 digit CIIU code). Among those wastes indicated, waste which could be listed as HW and LW are summarized in Table C.4.1c.

iii. From these examinations, the Study Team's recognition regarding categories of industries which have a high potentiality of generating HW generally coincided with the current EWI's classification. Meanwhile although the problems were identified, respective solutions were as follows.

- Although EWI's study included cases whereby food industries also generate ash and dust e.g. from boiler, these industries were excluded from the scope of the Study (or Surveys) since relevant wastes are generated from most industries. Meanwhile data from EWI's current study should be utilized to incorporate the Study's analysis.
- Similarly, LW (liquid waste) might also be generated from industries with lower potentiality of HW generation. The EWI's survey results should be mainly utilized for examining the industries with lower potentiality of HW generation. The survey should be focused on industries which may HW.

Table C.4.1c Possible Hazardous and Liquid Wastes according to Categories of Industries in the EWI Study

CIIU Code	Note 2	Hazardous Solid Wastes Code Number by the EWI Study	Liquid Wastes Code Number by the EWI Study
3111		-	304, 317
3112		206	304, 311, 371
3113		-	-
3114		264	304
3115		264	304, 401
3116		264	-
3117		264 (16)	304, 401
3118		264	-
3119		264	304
3121		264 (16)	304, 401
3122		264	304, 410
3131		-	-
3132		-	318, 319
3133		-	304
3134		-	304
3135		206	304
3140		264 (138)	
3211	@	206, 224, 228, 239, 240, 241, 247, 248, 264 (16)	304, 329, 340, 345, 356, 357, 392, 401, 402, 410, 411
3212		-	304
3213		247	-
3214		-	304
3219		228	
3220		228	304, 401, 402, 404
3231	@	202, 203, 221, 222, 228 (16)	304, 336, 401, 404
3232		-	404
3233		-	-
3240		-	-
3311		-	304
3312		-	304
3319	*	205, 221, 268 (16) (141)	304, 358, 365, 401
3320		(16) (141)	305, 401
3411	#	206, 264	304
3419	*	247, 254, 264 (16)	304, 312, 313, 342, 357, 371, 398, 401
3420	@	205, 206, 211, 214, 221, 228, 236, 244, 247, 254 (2) (16) (70)	304, 309, 313, 314, 349, 354, 356, 357, 375, 377, 380, 383, 392, 401, 402, 407, 409, 410, 415
3511	@	204, 206, 208, 215, 221, 226, 228, 229, 231, 247, 264 (16) (67)	304, 312, 313, 333, 336, 377, 401, 402
3512	@	223, 225, 228, 233, 247, 254, 255, 256, 257, 258, 264 (16)	301, 315, 328, 334, 412
3513	@	201, 206, 208, 250, 254, 259, 264, 266 (2) (16) (141)	304, 310, 312, 330, 334, 337, 338, 339, 341, 353, 401, 402, 411, 412, 413

3521	@	206, 222, 227, 228, 238, 246, 260, 264 (2) (16) (141)	305, 315, 333, 339, 364, 401, 402, 409
3522	@	221, 228, 231, 246, 247, 248, 252, 253, 261, 264 (16) (167)	304, 305, 306, 319, 324, 326, 331, 336, 341, 343, 344, 358, 363, 364, 397, 400, 401, 402, 404, 406, 408, 409, 410
3523	@	228, 247, 264 (2) (16)	304, 305, 334, 401, 402, 414 304, 305, 367, 377, 394, 401, 402
3529	@	208, 228, 235, 247, 262, 263, 264 (16)	
3530	*	254, 266	304, 312, 349, 371, 415
3540	@	228, 264 (16) (141)	304, 334, 401
3551	*	228, 259 (16) (67)	304, 325, 333, 334, 402, 410
3559	*	242, 254, 259 (2) (16)	316, 325, 334, 369, 377, 401, 404, 409, 410, 415
3560	*	206, 221, 228, 230, 247, 264 (2) (16) (141)	334, 333, 336, 339, 345, 366, 392, 401, 402, 404, 407, 410
3610		264	304, 392
3620	#	(141)	304, 334, 401
3691		264 (16)	-
3699	*	205, 206, 221, 249, 260, 264 (16)	304, 334, 339, 401
3710	@	205, 221, 228, 263, 264 (2) (16) (141)	308, 312, 328, 334, 352, 391, 401, 402, 409, 415
3720	*	205, 207, 208, 221, 228, 248, 254, 263, 264, 256 (2) (16) (52) (117) (141)	304, 319, 371, 373, 391, 401, 402, 415
3811	@	213, 227, 228, 267 (2) (16)	304, 312, 333, 334, 356, 401, 402, 409, 410, 414
3812	@	227, 228 (16) (141)	304, 338, 401, 402, 404, 410
3813	@	219, 227 (16) (67) (141)	304, 308, 323, 334, 391, 339, 401, 402, 409, 410
3819	@	206, 215, 221, 248, 264, 266, 267 (2) (16) (52) (67) (141)	304, 305, 308, 309, 311, 312, 328, 332, 334, 356, 371, 384, 387, 391, 395, 396, 401, 402, 404, 409, 410, 415, 416
3821	@	(16)	334
3822	@	206, 209, 221, 227, 228, 266, 267	304, 334, 401, 402
3823	@	221, 227, 228, 245, 264 (16) (141)	302, 304, 334, 401, 402, 405, 409, 410
3824	@	227, 264 (16) (141)	302, 303, 304, 334, 391, 395, 396, 401, 402, 404, 409, 410
3825	@	206, 207, 264 (16) (141)	304, 334, 401, 402, 412 304, 309, 319, 321, 325, 334, 349,
3829	@	206, 215, 221, 227, 228, 248, 254 (16) (67) (141)	401, 402, 403, 404, 409, 410, 412, 413
3831	@	206, 207, 222, 228, 264, 267, 270 (16) (141)	311, 325, 334, 338, 344, 371, 374, 377, 401, 402, 404, 409, 410, 412
3832	@	221, 227, 228 (16) (67) (141)	304, 308, 325, 334, 344, 361, 378, 391, 398, 401, 402, 409, 410, 415
3833	@	221, 227, 228 (16) (141)	304, 308, 325, 334, 344, 361, 378, 391, 398, 401, 402, 409, 410, 415 304, 305, 320, 343, 344, 376, 401, 402, 409, 410
3839	@	206, 227, 269 (16) (141)	

3841	@	205	334, 386, 401
3842	@	205, 222, 227 (16) (141)	304, 334, 371, 388, 401
3843	@	205, 221, 222, 227 (16) (67) (141)	308, 312, 334, 344, 351, 381, 389, 401, 402, 409, 410
3844	@	206, 228 (16) (67)	304, 312, 334, 344, 391, 401, 402, 409, 410
3845	@	206, 222, 227 (2) (16) (141)	304, 334, 344, 371, 382, 383, 390, 391, 393, 401, 402, 409, 410, 414
3849		-	304
3851	@	206, 207, 222, 227, 228 (16) (141)	304, 334, 339, 344, 356, 362, 387, 401, 402, 409, 410
3852	@	228 (16)	305, 344, 410
3853	@	264 (16) (141)	304, 319, 333, 334, 344, 348, 404, 407, 409, 410
3901	@	221, 227, 247 (16)	304, 313, 322, 391, 401, 402, 404, 409, 410
3909	@	206, 227, 228, 264 (141)	325, 334, 391, 401, 402, 409, 410

Note 1: In addition to the below-mentioned industries, the following industries are included in the Study.

- mining (23031, 23032, 23033, 23041, 29021, 29090)
- generation, transmission and distribution of electricity (41011)
- fuel stations (62536)
- laundries and dry cleaners (95201)

Note 2:
@; Both Chilean side and the Team recognized.
*; Although the Team did not propose to include these industries, they are listed because there are many hazardous wastes in the list of the EWI study. Since industries classified as 9 in the fourth digit (i.e. 3829) are others of 3 digit (i.e. 382?) industry, those should be examined in the detailed categories as 5 digits.
#; Although the Chilean side did not point out, the Team proposes to consider these industries of possible generators of hazardous wastes.

Note 3: Although the following figures, which are put in parentheses in the Table, are listed as non-hazardous in the EWI study, the Team proposes to include them.

- 2, 16, 31, 52, 67, 70, 116, 117, 138, 141, 167, 180

Actually, only following wastes were some time observed in the EWI's RISNOR study.

2	Adhesive	16	Worn-out activated coal
67	Lubricating grease	141	Pain residues

Table C.4.1d High Potential Industries of Generating Hazardous Wastes

Unit: Number of Industries

	CIIU Code	Nos of Employees				TOTAL
		> 500	200-499	100-199	50-99	
High Potential Industries	3211	7	14	16	25	62
	3231	0	2	1	9	12
	3319	0	0	1	4	5
	341	6	7	5	11	29
	3420	3	6	8	29	46
	351	0	0	3	8	11
	352	3	16	31	37	87
	354	0	2	2	1	5
	355	1	3	11	6	21
	356	0	12	29	51	92
	362	1	2	2	3	8
	3699	0	1	1	4	6
	371	1	5	7	3	16
	372	1	3	1	2	7
	381	2	25	39	56	122
	382	3	1	11	27	42
	383	0	5	9	12	26
	384	1	8	3	18	30
	385	0	0	3	3	6
	390	0	2	1	10	13
	Sub-total	29	114	184	319	646
Less Potential Industries	311	9	26	35	55	125
	312	0	5	8	8	21
	313	5	4	6	5	20
	314	0	0	0	2	2
	3212-3219	1	9	16	42	68
	322	5	14	30	67	116
	3232-3233	0	1	1	2	4
	324	4	9	14	34	61
	3311-3315	0	1	8	11	20
	332	0	5	8	15	28
	361	1	4	1	2	8
	3691-3696	1	8	9	13	31
	Sub-total	26	86	136	256	504
Total		55	200	320	575	1,150

C.4.2 Principles for incorporating EWI's investigations

Although the EWI's investigation focuses on non-hazardous waste, the status-quo of 265 factories'(see Table C.4.2a) generation and disposal of ISW could be summarized from questionnaire forms that were completed. On examining the framework of utilizing EWI's survey results, the following analyses were conducted in relation to data obtained from the EWI's report.

I. Identification of industrial classification and company's size of factories surveyed by EWI ;

ii. Identification of industries and factories which declare that they generate HW and LW in EWI's report, and identify the type and quantity of HW reported ; and

iii. Items surveyed by EWI and their depth of surveyed items. Complementability of those data and the Team's survey.

Consequently, the followings were observed:

I. As for HW reported in EWI's investigation, 186 ton/month in total are generated in the 265 factories. Among the 186 ton, 171 ton which is over 90 % of the total was generated in the high potential industries though the number of factories surveyed is 140 and about 50 % of the whole.

ii. As for liquid waste, the EWI's RISNOR study confirmed that only 166 ton/month was generated. However, used acids (Code No 313) waste water and blood (Code No 317) are of 150 ton/month and equivalent to 90 % of total generation. Hence such data are not reliable for the basis of investigating status-quo of the actual ISW generation.

iii. On the other hand, for non-hazardous solid waste it is found that significant information were surveyed including disposal destination. However, as shown in Table C.4.2a, factories surveyed by EWI comprise:

- 15 factories with 500 or more employees,
- 23 factories with 200 to 499 employees,
- 40 factories with 100 to 199 employees,
- 38 factories with 50 to 99 employees,
- 148 factories with less than 50 employees.

Therefore attention should be drawn to small and medium companies count for larger proportion in the EWI's survey.

In view of the above, the Study will, based on the data and information of EWI's investigation on non-hazardous solid waste, be determined to produce its framework with planning its surveys for actual conditions of industrial waste.

Table C.4.2a Factories Surveyed by EWI Study and Number of Their Employees by Scale of Factories

	CHU Code	Nos of Employees					TOTAL
		> 500	200-499	100-199	50-99	< 50	
High Potential Industries	3211	3	0	1	1	4	9
	3231	0	0	0	2	4	6
	3319	0	0	0	0	3	3
	341	1	3	2	0	1	7
	3420	0	1	0	1	5	7
	351	0	0	0	0	5	5
	352	1	1	0	2	5	9
	353	0	0	1	0	0	1
	355	0	1	0	0	5	6
	356	0	1	3	0	4	8
	362	1	0	1	0	2	4
	3699	0	1	0	0	1	2
	371	0	1	5	7	6	19
	372	1	1	1	0	2	5
	381	0	6	7	6	16	35
	382	0	0	0	0	2	2
	384	0	1	0	0	4	5
	385	0	0	1	0	0	1
	390	0	0	0	1	5	6
	Sub-total	7	17	22	20	74	140
Less Potential Industries	311	6	2	6	3	24	41
	312	0	0	3	1	1	5
	313	0	2	0	0	0	2
	3212-3219	0	0	2	0	4	6
	322	0	1	2	2	7	12
	324	1	0	0	0	1	2
	3311-3315	0	0	1	11	31	43
	332	0	0	2	0	3	5
	361	0	1	0	0	1	2
	3691-3696	1	0	2	2	2	7
	Sub-total	8	6	18	19	74	125
Total		15	23	40	39	148	265

Table C.4.2b HW Generation in 265 Factories Surveyed by EWI's RISNOR Study

Industrial Category	CIIU Code		EWI's Waste Category																		TOTAL
			002	016	052	067	116	158	167	180	205	208	211	221	227	229	241	253	263	264	266	
High Potential Industries	3211	S	-	-	-	-	-	-	-	20.0	-	-	-	-	-	-	-	-	-	240.0	-	260.0
		Q	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	2
	3231	S	-	-	-	-	-	-	-	20.0	-	-	-	-	-	-	-	-	-	200.0	-	220.0
		Q	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	2
	3319	S	-	-	-	-	-	-	-	48.0	-	-	-	-	-	-	-	-	-	-	-	48.0
		Q	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1
	341	S	8.0	-	-	-	-	30.0	-	-	-	-	-	-	-	-	-	-	-	38,000.0	42,599.0	80,637.0
		Q	1	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	1	2	5
	3420	S	-	-	-	-	30.0	263.2	-	150.0	-	-	26.4	-	-	-	-	-	-	-	-	469.6
		Q	-	-	-	-	1	2	-	1	-	-	1	-	-	-	-	-	-	-	-	5
	351	S	-	-	-	-	-	-	-	-	-	-	-	-	-	800.0	-	-	-	-	-	800.0
		Q	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	1
	352	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	603.0	-	-	-	603.0
		Q	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2
	355	S	-	20.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.0
		Q	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	371	S	13,440.0	-	-	-	-	-	-	9.8	-	-	-	-	-	-	-	-	3,200.0	26,600.0	-	43,249.8
		Q	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	3	3	-	9
	372	S	-	-	-	-	-	-	-	-	-	179.3	-	-	-	-	-	-	27,000.0	500.0	4,000.0	31,679.3
		Q	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	1	1	1	4
	381	S	-	5.0	2,000.0	5.0	-	-	10.0	530.0	150.0	-	-	-	1,800.0	-	20.0	-	-	-	-	4,520.0
		Q	-	1	1	1	-	-	1	2	1	-	-	-	1	-	1	-	-	-	-	9
	384	S	-	20.0	-	-	-	-	-	-	-	-	-	8,000.0	-	-	-	-	-	-	-	8,020.0
		Q	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	2
	390	S	0.1	-	-	-	-	-	-	13.0	-	-	-	-	-	-	-	-	-	-	-	13.1
		Q	1	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-	-	-	3
Total Potential Industries		S	13,448.1	45.0	2,000.0	5.0	30.0	293.2	10.0	790.8	150.0	179.3	26.4	8,000.0	1,800.0	800.0	20.0	603.0	30,200.0	65,540.0	46,599.0	170,539.8
		Q	3	3	1	1	1	3	1	10	1	1	1	1	1	1	1	2	4	7	3	46
Less Potential Industries	311	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5,663.0	980.0	6,643.0
		Q	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	3	13
	312	S	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	400.0	400.0
		Q	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1
	322	S	-	-	-	-	-	-	-	-	11.3	-	-	-	-	-	-	-	-	-	-	11.3
		Q	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	1
	3311-3315	S	50.0	-	-	-	-	-	-	4.0	-	-	-	-	-	-	-	-	-	-	-	54.0
		Q	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
	332	S	2.0	-	-	-	-	-	-	8,000.0	-	-	-	-	-	-	-	-	-	-	-	8,002.0
		Q	1	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	2
Total Less Potential Industries		S	52.0	-	-	-	-	-	-	8,004.0	11.3	-	-	-	-	-	-	-	-	5,663.0	1,380.0	15,110.3
		Q	2	-	-	-	-	-	-	2	1	-	-	-	-	-	-	-	-	10	4	19
Grand Total		S	13,500.1	45.0	2,000.0	5.0	30.0	293.2	10.0	8,794.8	161.3	179.3	26.4	8,000.0	1,800.0	800.0	20.0	603.0	30,200.0	71,203.0	47,979.0	185,650.1
		Q	5	3	1	1	1	3	1	12	2	1	1	1	1	1	1	2	4	17	7	65

Note: Unit: Kg/Month
S: Amount of wastes
Q: Number of factories

Table C.4.2c Liquid Waste Generation Surveyed by the EWI's RISNOR Study

			EWI's Waste Category																
Industrial Category	CIIU		141	304	313	317	321	328	334	339	349	357	369	385	401	407	415	417	TOTAL
High	3211	S	-	180.0	-	-	-	-	-	-	-	-	-	-	-	7.5	-	-	187.5
Potential		Q	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2
Industries	341	S	-	20.0	-	-	-	-	-	-	-	-	-	-	-	20.0	-	-	40.0
		Q	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	2
	3420	S	-	-	-	-	-	-	-	0.2	-	-	-	3.0	-	5.0	-	-	8.2
		Q	-	-	-	-	-	-	-	1	-	-	-	1	-	1	-	-	3
	352	S	2,020.0	-	-	-	-	-	-	-	1.3	-	-	-	-	-	-	-	2,021.3
		Q	3	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	4
	355	S	-	8.0	-	-	-	-	-	-	-	-	0.1	-	-	-	-	-	8.1
		Q	-	1	-	-	-	-	-	-	-	-	1	-	-	-	-	-	2
	362	S	43.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	43.0
		Q	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
	371	S	12.7	-	-	-	-	-	237.0	-	-	-	-	-	-	-	-	-	249.7
		Q	3	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	6
	381	S	2,070.2	214.6	-	-	16.0	5.0	2.0	-	-	-	-	-	200.0	-	2.0	-	2,509.8
		Q	10	4	-	-	1	1	1	-	-	-	-	-	1	-	1	-	19
	390	S	116.0	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	117.3
		Q	1	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
Total high Potential Industries		S	4,261.9	423.9	-	-	16.0	5.0	239.0	0.2	1.3	-	0.1	3.0	200.0	32.5	2.0	-	5,184.9
		Q	18	8	-	-	1	1	4	1	1	-	1	1	1	3	1	-	41
Less	311	S	-	6.0	62,000.0	87,520.0	-	-	-	-	-	-	-	-	-	-	-	-	149,526.0
Potential		Q	-	1	1	2	-	-	-	-	-	-	-	-	-	-	-	-	4
Industries	312	S	-	1,000.0	-	-	-	800.0	-	-	-	-	-	-	-	-	-	35.0	1,835.0
		Q	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	1	3
	3212-3219	S	-	14.0	-	3.0	-	-	-	-	-	6.0	-	-	-	-	-	-	23.0
		Q	-	1	-	3	-	-	-	-	-	1	-	-	-	-	-	-	5
	332	S	22.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.1
		Q	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2
	3691-3696	S	-	1,500.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1,500.0
		Q	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
Total Less Potential Industries		S	22.1	2,520.0	62,000.0	87,523.0	-	800.0	-	-	-	6.0	-	-	-	-	-	35.0	152,906.1
		Q	2	4	1	5	-	1	-	-	-	1	-	-	-	-	-	1	15
Grand Total		S	4,284.0	2,943.9	62,000.0	87,523.0	16.0	805.0	239.0	0.2	1.3	6.0	0.1	3.0	200.0	32.5	2.0	35.0	158,091.0
		Q	20	12	1	5	1	2	4	1	1	1	1	1	1	3	1	1	56

Table C.4.2d ISW Generation by EWI's RISNOR Study

Industrial Category	CIUU	Number of Industries	Number of Employees	Generation Amount	Generation Ratio Kg/empl.	NON-HAZARDOUS	HAZARDOUS	LIQUID
High	3211	9	2,608	394,673.9	151.3	394,226.4	260.0	187.5
Potential	3231	6	297	202,370.0	681.4	202,150.0	220.0	0.0
Industries	3319	3	63	44,062.0	699.4	44,014.0	48.0	0.0
	341	7	2,106	1,524,944.3	724.1	1,444,267.3	80,637.0	40.0
	3420	7	551	69,251.3	125.7	68,773.5	469.6	8.2
	351	5	117	30,700.0	262.4	29,900.0	800.0	0.0
	352	9	1,267	100,078.3	79.0	99,474.0	603.0	2,021.3
	353	1	119	5,622.0	47.2	5,622.0	0.0	0.0
	355	6	345	46,646.7	135.2	46,618.6	20.0	8.1
	356	8	829	22,360.2	27.0	22,360.2	0.0	0.0
	362	4	819	62,803.0	76.7	62,803.0	0.0	43.0
	3699	2	397	11,035.0	27.8	11,035.0	0.0	0.0
	371	19	1,686	1,386,947.8	822.6	1,343,461.0	43,249.8	249.7
	372	5	1,547	274,908.8	177.7	243,229.5	31,679.3	0.0
	381	35	3,782	873,287.2	230.9	868,327.6	4,520.0	2,509.8
	382	2	36	802.0	22.3	802.0	0.0	0.0
	384	5	434	53,396.6	123.0	45,376.6	8,020.0	0.0
	385	1	175	2,100.0	12.0	2,100.0	0.0	0.0
	390	6	157	4,736.6	30.2	4,722.2	13.1	117.3
Total Potential Industries		140	17,335	5,110,725.7	294.8	4,939,262.9	170,539.8	5,184.9
Less	311	41	6,831	2,212,063.8	323.8	2,055,894.8	6,643.0	149,526.0
Potential	312	5	555	65,897.5	118.7	63,662.5	400.0	1,835.0
Industries	313	2	740	136,500.0	184.5	136,500.0	0.0	0.0
	3212-3219	6	313	13,056.0	41.7	13,033.0	0.0	23.0
	322	12	1,031	15,553.8	15.1	15,542.5	11.3	0.0
	324	2	648	5,908.0	9.1	5,908.0	0.0	0.0
	3311-3315	43	1,619	1,805,560.5	1,115.2	1,805,506.5	54.0	0.0
	332	5	298	41,132.6	138.0	33,130.6	8,002.0	22.1
	361	2	280	685,397.0	2,447.8	685,397.0	0.0	0.0
	3691-3696	7	987	294,258.0	298.1	292,758.0	0.0	1,500.0
Total Less Potential Industries		125	13,302	5,275,327.2	396.6	5,107,332.9	15,110.3	152,906.1
	TOTAL	265	30,637	10,386,052.9	339.0	10,046,595.8	185,650.1	158,091.0

Note: Unit: Kg/month

Genearation Amount = Non-hazardous+Hazardous+Liquid - (double count)

C.4.3 Selection of Factories

a. Numbers of companies to be surveyed

In addition to the outcome of the above examination, conditions to be considered for the selection of factories to be surveyed were as follows:

- There were time and budget limitations.
- It was anticipated that at least one-third of companies might refuse to be interviewed if either of two members of counterpart from SESMA-PROCEFF did not accompany the visit.
- Pilot surveys revealed that significant level of technological understanding on factories' process and waste generation was required on the part of interviewers.
- This survey was intended not only to estimate waste generation amount, but also to form bases for examining ISWM on-site including waste-minimization/recycling technology and for examination and reviewal of *administrative monitoring and guideline, waste management technology* dissemination. Therefore, consideration to relative administrative aspects in this regard was required for the selection of factories.

In relation to the above conditions to be considered, criteria for the selection of factories to be visited should be as follows:

- Prior to consignment of the factory surveys to the local consultants, pilot surveys should be conducted by the Study Team and counterpart members from SESMA-PROCEFF for 10 factories (which are among the industries that seem to be generating HW), which should be chosen by SESMA-PROCEFF.
- During the period of the Team's "First Work in Chile", another set of 10 factories should be investigated by the Study Team.
- The duration between the Team's "First Work in Chile" and the "Second Work in Chile"" (or from middle of march '95 to end of April '95), the local consultants assigned should proceed the investigation of 50 factories.
- One way or another, including the Team's surveys of "in-factory" process management, 200 factories were to be investigated.
- Data and information from EWI's 265 factories investigation could be utilized complementarily to the data and information to be obtained from the Team's survey of "actual conditions of ISW", which may form in total about 400 factories' data and information. Therefore certain level of identification and examination of actual conditions of ISW (including

generation, process management, in-factory treatment and disposal, final disposal) could be assessed for major industries in the Metropolitan Region.

- In order to secure the acquisition of data and information of 200 factories, about 270 companies should be selected, bearing in mind one-fourth of the companies might refuse the interview.

Although the previous investigation conducted by D&M's RISPEL study might be useful in analyses of generality such as "analysis of industries and factories generating HW", "analysis of transport and disposal of waste from industries" etc., it was anticipated that the D&M investigation would not be a good reference for identification and understanding of factories' actual conditions (such as waste generation amount, in-factory waste management).

b. Selection of factories to be surveyed

The factories to be surveyed were selected, as listed in Table C.4.3a, based on the following criteria for respective categories.

ba. Number of companies to be surveyed

In total, between 270 to 280 companies should be selected. About 15 of them should be from electricity generation, gasoline filling station and laundries. Hence, about 260 companies should be selected from manufacturing industries and it was expected that 190 out of 260 may accept the survey interviews.

bb. Companies to be surveyed in the First stage (until end of April 95)

As for the survey, until the end of April' 95, 100 companies should be selected and it was expected that data and information from 70 factories should be obtained. Two gas filling stations and 2 laundries should be included in this survey.

bc. Selection of factories with more than 499 employees

Whereas EWI surveyed 15 factories with more than 499 employees, all factories (55) with 500 or more employees should be surveyed in view of including countercheck of data and information of the EWI's survey.

bd. Selection of companies with less than 499 employees (with a lower potentiality of hazardous waste generation)

EWI investigated 117 factories (out of 1,150 factories with more than 49 employees) which have a lower potentiality of generating HW. In addition to this 117 factories, if 11 factories (with more than 499 employees with lower potentiality of hazardous generation) were newly surveyed on this occasion, the actual conditions of industries with lower potentiality of HW generation could be significantly identified and understood. Therefore, companies with less than 500 employees (which have a lower potentiality of hazardous waste generation) should not be selected for this survey, although some issues might remain such as identification and understanding of actual conditions of "liquid waste" and "generation of HW under lower potentiality" in this regard.

be. Selection of companies with less than 500 employees (which has a higher potentiality of hazardous waste generation)

- For companies with more than 199 but less than 500 employees, all 114 factories should be selected.
- For companies with more than 99 but less than 200 employees, 40 % of companies in this category should be selected.
  Up to this selection there are 243 companies in total. In addition to this, industries in which there is no companies with 100 employees (e.g. CIIU Code 3512) might have to be included in the course of the survey.
- EWI investigated 94 factories (with less than 200 employees) from industries liable to generate HW, which might be utilized for understanding the actual conditions of non-hazardous solid waste. However, it might not be usable for understanding the status-quo of HW. Therefore identification and understanding of the status-quo of HW should be pursued through the outcome of the Survey.

bf. Number of factories to be visited which had already been visited for the EWI's study

About 40 factories were visited (some of which were also visited during the previous ESI survey) which comprise:

- 15 factories with more than 499 employees,
- 17 factories with a high potential of hazardous waste generation with more than 199 to not more than 500 employees, and
- a few factories with a high potential of hazardous waste generation with

less than 200 employees.

However, reduplicative visits to this extent were considered necessary for examining and reviewing the validity of EWI's investigation.

Table C.4.3a List of Factories to be Surveyed

Factories with 500 or more employees

	No.		CIIU	Tamaño	Org_Jur	NOMBRE_EMP	DIRECCION	CIUDAD	COMUNA	TELEFONO
High Potential Industries	3211	1	3211	7	2	MACHASA COMPLEJO TEXTIL LTDA	PEDRO MONTT 2354	SANTIAGO	SANTIAGO	5561001
		2	3211	7	4	IND TEXTILES POLLAK HNOS Y CIA S A	AV P DE VALDIVIA 6349	SANTIAGO	MACUL	2384811
		3	3211	6	4	COMANDARI S A HILADOS Y PANOS LANA	AVDA CARLOS VALDOVINOS 420	SANTIAGO	SAN JOAQUIN	5515011
		4	3211	6	4	MANUFACTURAS SUMAR S A	CARLOS VALDOVINOS 200	SANTIAGO	SN JOAQUIN	5525738
		5	3211	6	4	MANUFACTURAS SUMAR S A	CARLOS VALDOVINOS 200	SANTIAGO	SN JOAQUIN	5525738
		6	3211	7	4	MANUFACTURAS SUMAR S A	C VALDOVINOS 200	SANTIAGO	SAN JOAQUIN	5525738
		7	3211	6	4	HILOS CADENA S A	CAMINO EL RETIRO 02050	SANTIAGO	PUENTE ALTO	8501516
	341	8	3411	6	4	CIA MANUF PAPELES Y CARTONES S A	AGUSTINAS 1343	STGO	SANTIAGO	6981941
		9	3411	6	4	VERA Y GIANNINI S A C E I	SAN IGNACIO 1538	SANTIAGO	SANTIAGO	5567895
		10	3412	6	4	VERA Y GIANNINI IMPRESORES S A	SAN IGNACIO 1538	SANTIAGO	SANTIAGO	5567894
		11	3419	6	4	CIA MANUFACT.PAPELES Y CARTONES S.A	AGUSTINAS 1343	SANTIAGO	SANTIAGO	6981941
		12	3419	6	4	PRODUCTOS SANITARIOS S A	AYSEN 321	SANTIAGO	MACUL	
		13	3419	6	4	PAPELES INDUSTRIALES S A	MARTINEZ DE ROZAS 4553	SANTIAGO	QTA NORMAL	7758805
	3420	14	3420	7	4	EMPRESA EL MERCURIO S A P	AV STA MARIA 5542	STGO	VITACURA	22870480
		15	3420	6	4	CONSORCIO PERIODISTICO DE CHILE S A	VICUNA MACKENNA 1870	SANTIAGO	NUNOA	5517067
		16	3420	6	4	EDITORIAL LORD COCHRANE S A	PROVIDENCIA 727	SANTIAGO	PROVIDENCIA	2360000
	352	17	3522	6	6	INSTITUTO DE SALUD PUBLICA DE CHILE	AVDA. MARATHON 1000	STGO	NUNOA	2391105
		18	3522	6	4	LABORATORIO CHILE S A	AVDA MARATHON 1315	STGO	NUNOA	2387266
		19	3529	7	4	LEVER CHILE S A	CARRASCAL 3551	SANTIAGO	QTA NORMAL	6812511
	355	20	3551	6	4	GOODYEAR DE CHILE S A I C	CAM A MELIPILLA S/N KM 16	STGO	MAIPU	5356990
	356	21	3620	6	4	CRISTALERIAS DE CHILE S A	CAM A VALPARAISO 501	SANTIAGO	PENAFLOR	5561021
	371	22	3710	6	4	MOLIBDENOS Y METALES S A	HUERFANOS 812	SANTIAGO	SANTIAGO	6382550
	372	23	3722	6	4	MADECO S A	URETA COX 930	SANTIAGO	SN MIGUEL	5516613
	381	24	3814	6	4	CIA ELABORADORA DE METALES S A	SAN NICOLAS 860	SANTIAGO	SAN MIGUEL	5556070
		25	3814	6	4	IND GENERALES Y COMPLEM DEL GAS S.A	LOGRONO 3871	SANTIAGO	EST CENTRAL	6835050
	382	26	3829	7	6	FCAS Y MAESTRANZAS DEL EJERCITO	AVDA PEDRO MONTT 1606	SANTIAGO	SANTIAGO	5561011
		27	3829	6	4	CIMETSINDELEN S A	AV VICUNA MACKENNA 9840	SANTIAGO	LA FLORIDA	2811881
		28	3829	7	4	CTI CIA TECNO INDUSTRIAL S A	A LLONA 777	STGO	MAIPU	5312131
	384	29	3845	7	6	EMP NAC AERONAUTICA DE CHILE	AV JOSE M CARRERA 11087	SANTIAGO	SAN BERNARDO	5283007

Less Potential Industries	311	30	3111	6	2	AGRICOLA ARIZTIA LTDA	LOS CARRERA 444	MELIPILLA	MELIPILLA	8323169
		31	3111	6	4	FRIG O HIGGINS MAT IND S A C	CAM MELIPILLA 8139	STGO	CERRILLOS	5578745
		32	3112	7	4	SAVORY S.A.I.C.	VICUNA MACKENNA 4230	STGO	MACUL	5524710
		33	3112	7	4	SOPROLE S A	DIAGONAL SANTA ELENA 2605	SANTIAGO	SAN JOAQUIN	5528499
		34	3113	7	4	NUTRECOR S.A.S S A	AV RAMON FREIRE 3302	SANTIAGO	MAIPU	5312755
		35	3117	6	4	CENTENARIO S A	ROGER DE FLOR 2800	SANTIAGO	LAS CONDES	2333030
		36	3117	6	4	FIDEOS CAROZZI S A	CAM LONGITUDINAL SUR 5201	SANTIAGO	SAN BERNARDO	6971747
		37	3117	6	4	COSTA S A	CAM LONGITUDINAL SUR 5201 (NOS	SANTIAGO	SAN BERNARDO	6971747
		38	3119	7	2	IND DE ALIMENTOS DOS EN UNO LTDA	PLACER 1324	SANTIAGO	SANTIAGO	5567431
	313	39	3132	7	4	S.A. VINA STA. RITA	GERTRUDIS ECHENIQUE 49	SANTIAGO	LAS CONDES	2289166
		40	3133	6	2	CERVECERA SANTIAGO LTDA	PANAMERICANA NORTE 8000	SANTIAGO	QUILICURA	6232962
		41	3134	6	4	EMBOTELLADORA CHILE S A	AV DOMINGO STA M 1946	SANTIAGO	INDEPENDENCI	7371051
		42	3134	6	4	EMBOTELLADORA ANDINA S A	CARLOS VALDOVINOS 560	SANTIAGO	SAN JOAQUIN	5509000
		43	3134	6	2	EMBOTELLADORA MODELO LTDA	PANAM NORTE 1500	STGO	RENCA	6418611
	3212-3219	44	3213	6	4	TEJIDOS CAFFARENA S A	CAM MELIPILLA 10600	STGO	MAIPU	5572311
	322	45	3220	7	4	CALDERON CONFECCIONES SAC	NUBLE 1034	STGO	SANTIAGO	55670610
		46	3220	6	2	CONFEC TEXTILES EL AGUILA LTDA	GAMERO 2085	SANTIAGO	INDEPENDENCI	7377208
		47	3220	6	4	ITALMOD S A	DOMINGO SANTA MARIA 2365	SANTIAGO	INDEPENDENCI	7370088
		48	3220	6	4	MANUFACTURAS TEXTILES INDIGO S A	JUAN ELIAS 1701	SANTIAGO	RECOLETA	6217739
		49	3220	6	4	GARMENT MANOFACT.AND TRADING S.A.	AMERICO VESPUCIO 701	SANTIAGO	QUILICURA	6031823
	324	50	3240	6	4	ORMAC S A	SAN FRANCISCO 285	STGO	SANTIAGO	6383388
		51	3240	7	2	FCA DE CALZADOS GINO LTDA	EMILIO VAISSE 770	SANTIAGO	NUNOA	2250943
		52	3240	6	4	CATECU S A	D NAVARRO S/N	PENAFLOR	PENAFLOR	812006
		53	3240	7	4	CATECU S A	D NAVARRO S/N	PENAFLOR	PENAFLOR	8120061
	361	54	3610	7	4	INDUSTRIA LOZAPENCO S.A.	COPIAPO 750	SANTIAGO	SANTIAGO	
	3691-3696	55	3695	6	4	SOC INDUSTRIAL PIZARRENO S A	CAMINO MELIPILLA 10803	SANTIAGO	MAIPU	715015

Factories with 200 to 499 employees

		Nro.	CIIU	Tamaño	Org Jur	NOMBRE EMP	DIRECCION	CIUDAD	COMUNA	TELEFONO
High Potential Industries	3211	1	3211	5	4	LANIFICIO PANAMERICANO S A	PANAMERICANA NORTE 1377	SANTIAGO	INDEPENDENCI	7772923
		2	3211	5	4	HILANDERIA MAISA S A	EL ROBLE 1077	SANTIAGO	RECOLETA	62126550
		3	3211	5	4	ALGODONES HIRMAS S A	AVDA MARATHON 2239	STGO	MACUL	2390322
		4	3211	5	4	HILADOS Y TEJIDOS GARIB S A	R DE ARAYA 951	SANTIAGO	MACUL	2384007
		5	3211	5	4	LANERA CHILENA S A	LOS PLATANOS 2554	STGO	MACUL	2384391
		6	3211	5	2	MANUFACTURAS EBLEN Y CIA LTDA	DGO ARTEAGA 588	STGO	MACUL	2384443
		7	3211	5	4	MANUFACTURAS MACUL S.A.	E FERNANDEZ 3663	SANTIAGO	MACUL	2839833
		8	3211	5	4	TEXTIL PROGRESO S A	AV V MACKENNA 3350	STGO	MACUL	2384215
		9	3211	5	4	IND TEXTILES ARTELA S A	DAGOBERTO GODOY 16	STGO	CERRILLOS	6832107
		10	3211	5	4	FIBRAS TEXTILES UNIVERSAL S A	CAMINO MELIPILLA 9202	STGO	MAIPU	5573673
		11	3211	5	4	IND TEXTIL ARAGON S A	CLAUDIO VICUNA 4194	STGO	QTA NORMAL	7731048
		12	3211	5	4	HILANDERIA RENCA S.A.	ALBERTO PEPPER 1610	STGO	RENCA	6418585
		13	3211	5	4	MANUFACTURAS TEXT PICHARA HNOS S A	BANDERA 661	SANTIAGO	SANTIAGO	6968208
		14	3211	5	4	TEXTIL LO ESPEJO S A	AHUMADA 47	SANTIAGO	SANTIAGO	6713019
	3231	15	3231	5	4	BELTRAN ILHARREBORDE S A	RECOLETA 1750	SANTIAGO	RECOLETA	6217107
		16	3231	5	4	CALZADOS Y CURTIDOS CALVO Y CIA S A	AV VICUNA MACKENNA 4885	SANTIAGO	SAN JOAQUIN	5524298
	341	17	3411	5	4	VIGAFLES S.A.	PLACER 565	SANTIAGO	SANTIAGO	5553844
		18	3411	5	2	SOCIEDAD RECUPERADORA DE PAPEL LTDA	VENECIA 3200	SANTIAGO	SAN JOAQUIN	5512278
		19	3412	5	2	GRAFICA E IMPRESORA ARAUCO LTDA	BUEN ORDEN 1025	STGO.	INDEPENDENCI	7377576
		20	3412	5	4	LITOGRAFIA MARINETTI S A	BELLAVISTA 0251	STGO	PROVIDENCIA	6018888
		21	3412	5	4	FCA PAPELES CARRASCAL S A	CARRASCAL 5150	STGO	QTA NORMAL	7732146
		22	3412	5	2	ENVASES IMPRESOS LTDA	LO ECHEVERS 221	STGO	QUILICURA	6033447
		23	3419	5	4	VIGAMIL S A C E I	JOSE ANANIAS 505	SANTIAGO	MACUL	2385111
	3420	24	3420	5	4	EDITORIAL UNIVERSITARIA S A	SAN FRANCISCO 454	SANTIAGO	SANTIAGO	2234555
		25	3420	5	4	EMPRESA PERIOD LA NACION S A	AGUSTINAS 1269	SANTIAGO	SANTIAGO	6982222
		26	3420	5	2	PRODUCTOS DE PAPEL LTDA	AV ZANARTU 1049	SANTIAGO	NUNOA	2386266
		27	3420	5	4	TALLERES GRAFICOS SMIRNOW S A	MARIA AUXILIADORA 779	SANTIAGO	SAN MIGUEL	5528859
		28	3420	5	4	EDITORIAL ANTARTICA S A	SAN FRANCISCO 116	STGO	SANTIAGO	6393409
		29	3420	5	6	CASA DE MONEDA DE CHILE	AVDA PORTALES 3586	SANTIAGO	EST CENTRAL	6891034
	352	30	3521	5	4	PINTURAS ANDINA S A	APOQUINDO 3530	STGO	LAS CONDES	2463636
		31	3521	5	4	INDUSTRIAS CERESITA S A	GABRIEL PALMA 820	STGO	RECOLETA	6211007
		32	3521	5	2	IND PINTURAS ADOLFO STIERLING LTDA	AVDA LA DIVISA 0359	SANTIAGO	SAN BERNARDO	5580011
		33	3522	5	4	LABORATORIOS RECALCINE S A	V MACKENNA 1094	STGO	NUNOA	6345094
		34	3522	5	4	BAYER DE CHILE S A	CARLOS FERNANDEZ 260	SANTIAGO	SAN JOAQUIN	5555561

	35	3522	5	4	INSTITUTO BIOQUIMICO BETA S A	AV LAS AMERICAS 580	SANTIAGO	CERRILLOS	5578080
	36	3523	5	4	LABORATORIO DURANDIN S A I	AV M RODRIGUEZ 1052	SANTIAGO	SANTIAGO	6983381
	37	3523	5	4	UNION QUIMICA AMERICANA S A	JULIO PRADO 858	STGO	PROVIDENCIA	2749250
	38	3523	5	4	INDUSTRIA QUIMICA Y COSMETICA S A	AV ZA%ARTU 1370	SANTIAGO	NUNOA	2383515
	39	3523	5	4	LABORATORIOS DAVIS S A	AV. LOS PAJARITOS 6366	STGO	EST CENTRAL	7925160
	40	3523	5	2	LAB BALLERINA LTDA	A E WILLIAMS 190	STGO	CERRILLOS	5571732
	41	3523	5	4	LABORATORIO LABSA S A	LAZO DE LA VEGA 4859	STGO	QTA NORMAL	7735828
	42	3523	5	2	COSMETICOS PROCOBEL LTDA.	CARRASCAL 3585	STGO	QTA NORMAL	6812258
	43	3529	5	4	RECKITT & COLMAN CHILE S.A.	PINTOR CICARELLI 268	SANTIAGO	SAN JOAQUIN	5511441
	44	3529	5	4	QUIMICA HARTING S A	PANAMERICANA NT 2932	SANTIAGO	RENCA	6418592
	45	3529	5	4	TEC HARSEIM S A I C	AV BDO O'HIGGINS 723 of.19 E	STGO	SANTIAGO	383814
354	46	3540	5	2	VITUMIX LTDA.	LOS TRES ANTONIOS 3172	SANTIAGO	MACUL	
	47	3540	5	2	EMP CONSTRUCTORA COMERCO LTDA.	RAFAEL CANAS 16/C	STGO	PROVIDENCIA	2748962
355	48	3551	5	4	MANUF CHILENAS DE CAUCHO S A	LOS 3 ANTONIOS 2580	STGO	MACUL	2382204
	49	3559	5	2	MANUF DE CAUCHO BLASMAR LTDA	LOS QUILLAYES 66	SANTIAGO	LA FLORIDA	2886042
	50	3559	5	4	VULCO S A	SAN JOSE 0855	SANTIAGO	SAN BERNARDO	8592353
356	51	3560	5	4	WENCO S. A .I.	CELIA SOLAR 215	SANTIAGO	SAN JOAQUIN	5566496
	52	3560	5	4	MANUF DE POLIETILENO S A	AV EINSTEIN 1071	STGO	RECOLETA	6218515
	53	3560	5	4	IND TECNOLOGIA HIDR.EN MIN.Y CONST.	BELLAVISTA 377	SANTIAGO	RECOLETA	7379498
	54	3560	5	4	ARGOS S A	LOS PLATANOS 2545	STGO	MACUL	2383346
	55	3560	5	4	PLASTICOS BURGOS S A	LAS DALIAS 3180	SANTIAGO	MACUL	2384703
	56	3560	5	2	PLASTICOS HADDAD S.A.	JOSE ANANIAS 444	STGO	MACUL	2383419
	57	3560	5	2	UNIVERSAL PLASTICS LTDA	SANTA ROSA 2970	SANTIAGO	SAN JOAQUIN	5514081
	58	3560	5	4	OTTO KRAUS SAIC	AHUMADA 179 3 PISO	STGO	SANTIAGO	5521405
	59	3560	5	2	SANCHEZ Y CIA LTDA	HOEVEL 5067	STGO	QTA NORMAL	7732960
	60	3560	5	4	AISLANTES NACIONALES S A	SENADOR GUZMAN 220	SANTIAGO	QUILICURA	6232772
	61	3560	5	4	PROD PLASTICOS DEL PACIFICO S A	AVD. PDTE. EDO. FREI KM.17 S/N	SANTIAGO	COLINATA	374078
	62	3560	5	2	COMPAGNON BERNABE Y CIA LTDA	SANTA MARGARITA 0830	SANTIAGO	SAN BERNARDO	5586596
362	63	3620	5	4	VIDRIOS LIRQUEN S A	DOMINGO ARTEAGA 291	SANTIAGO	MACUL	2380067
	64	3620	5	4	CRISTALERIAS TORO S A I C	DAGOBERTO GODOY 145	STGO	CERRILLOS	6833972
3699	65	3699	5	4	IND DE BALATAS INDUBAL S A C	CAM MELIPILLA 10750	STGO	MAIPU	5573306
371	66	3710	5	4	COMPANIA ELECTRO METALURGICA S A	AVDA VICUNA MACKENNA 1570	SANTIAGO	NUNOA	5555545
	67	3710	5	4	SIDERURGICA AZA S A	LA UNION 3070	SANTIAGO	RENCA	6418683
	68	3710	5	4	ACEROS CHILE S.A.	AV PORTALES 3499-A	NOS	SAN BERNARDO	8573199
	69	3710	5	4	CARBOMET INDUSTRIAL S A	HUERFANOS 812 OF 614	SANTIAGO	SANTIAGO	6338465
	70	3710	5	4	VULCO S.A.	SAN JOSE 0855	SANTIAGO	SAN BERNARDO	

372	71	3722	5	4	INDUSTRIAS METALURGICAS SORENA S A	RODRIGO DE ARAYA 96	SANTIAGO	SAN JOAQUIN	5513307
	72	3722	5	4	MADECO S A	URETA COX 930	SANTIAGO	SN MIGUEL	5516613
	73	3722	5	4	COBRE CERRILLOS S A	CAM MELIPILLA 6307	STGO	CERRILLO	5573144
381	74	3811	5	4	IND METALURGICA SCANAVINI S A	CAM MELIPILLA 7525	STGO	CERRILLOS	5571297
	75	3812	5	4	INDUSTRIA DE FRIO Y GAS S A FRIGAS	CARMEN MENA 865	SANTIAGO	SAN MIGUEL	5210026
	76	3813	5	4	TECNOLOGIA DEL ALUMINIO S.A.	CAMINO GUANACO 4756	STGO	CONCHALI	6253411
	77	3813	5	4	ALFONSO WOLF S A	LOS PINONES 7	PROVIDENCIA	PROVIDENCIA	2518387
	78	3813	5	4	CINTAC CIA IND TUBOS ACERO S A	CAM MELIPILLA 8920	STGO	CERRILLOS	5575070
	79	3813	5	4	ARMCO INSTAPANEL S A	CAM A LONQUEN 11011	SANTIAGO	MAIPU	5524088
	80	3813	5	2	KALHA TEKNO LTDA	AGUIRRE 1270	QTA. NORMAL	QTA. NORMAL	7733992
	81	3813	5	4	B.BOSCH S.A.	PANAM NORTE 3066	STGO	RENCA	6238500
	82	3813	5	4	SOC MET ARRIGONI HNOS S A	AMERICO VESPUCIO 1881	STGO	QUILICURA	6032223
	83	3813	5	2	METALURGICA MORGAN Y FUENZALIDA LTD	AVDA LA DIVISA 0340	SANTIAGO	SAN BERNARDO	5585181
	84	3814	5	4	ALUSA S A	AV VICUNA MACKENNA 2935	SANTIAGO	SAN JOAQUIN	5529211
	85	3814	5	4	FCA DE ENLOZADOS CONDOR S A	SANTA ROSA 6583	SANTIAGO	SAN RAMON	5251963
	86	3814	5	4	CORESA S A CONTENEDORES REDES Y ENV	SAN NICOLAS 630	SANTIAGO	SAN MIGUEL	5521344
	87	3814	5	4	MANUF METAL RHEEM CHILENA S A	CAM MELIPILLA 10340	STGO	CERRILLOS	5572064
	88	3814	5	4	ALUMINIO Y ENLOZADO FANTUZZI S A	CAMINO A MELIPILLA 8455	SANTIAGO	CERRILLOS	5571282
	89	3814	5	4	ENVASES DEL PACIFICO S.A.	CAM MELIPILLA 13320	STGO	MAIPU	5355986
	90	3814	5	4	FABRICA DE ENVASES S A	VICENTE REYES 595	SANTIAGO	MAIPU	5314443
	91	3814	5	4	IND METALURGICA TROTTER S A	SAN PABLO 3770	SANTIAGO	QTA NORMAL	7739423
	92	3815	5	4	FABRICA DE ALAMBRES ELCO S.A.	ALCALDE PEDRO ALARCON 893	SANTIAGO	SAN MIGUEL	5567591
	93	3815	5	4	AMERICAN SCREW CHILE S A	CAM MELIPILLA 10338	STGO	CERRILLOS	5572204
	94	3815	5	4	PROD DE ACERO S A PRODINSA	EL MILAGRO 455	STGO	MAIPU	5355977
	95	3819	5	2	PATRICIO LIOI Y CIA LTDA	SAZIE 2973	STGO	SANTIAGO	6897423
	96	3819	5	4	BRONCERIAS NIBSA S A	JUAN GRIEGO 4429	SANTIAGO	SAN JOAQUIN	5521215
	97	3819	5	4	FCA DE FITTINGS Y ART SANITARIOS SA	BUZETA 3359	SANTIAGO	EST CENTRAL	6831355
	98	3819	5	4	METALURGICA VIRUTEX ILKO S A	CAM MELIPILLA 7875	STGO	CERRILLLOS	5574602
382	99	3829	5	4	CATECU S A	D NAVARRO S/N	PENAFLOR	PENAFLOR	8120061
383	100	3831	5	4	SCHAFFNER S.A.	HNO.EYRAUD 577	STGO.	EST CENTRAL	7795015
	101	3833	5	4	SOC MANUF DE ELECTROARTEFACTOS S A	ANTONIO ESCOBAR WILLIAMS 600	SANTIAGO	CERRILLOS	5574225
	102	3839	5	4	GENERAL ELECTRIC DE CHILE S.A.	VICUNA MACKENNA 2385	SANTIAGO	SAN JOAQUIN	5553031
	103	3839	5	4	S A IND METALURGICA Y ELECTRICA	CAM MELIPILLA 7565	STGO	CERRILLOS	5576828
	104	3839	5	4	INDURA S A INDUSTRIA Y COMERCIO	CAM A MELIPILLA 7060	SANTIAGO	CERRILLOS	5571777
	384								
384	105	3842	5	6	FERROCARRILES DEL ESTADO	AVDA L B O'HIGGINS 3322	SANTIAGO	EST CENTRAL	7796515

		106	3842	5	6	FERROCARRILES DEL ESTADO	AVDA L B O'HIGGINS 3322	SANTIAGO	EST CENTRAL	7763869
		107	3843	5	4	PEREIRA HNOS S.A.	AV INDEPENDENCIA 3160	STGO	CONCHALI	7361932
		108	3843	5	4	J RIVEROS S A I C	SAN NICOLAS 912-960	STGO	SAN MIGUEL	5514411
		109	3843	5	4	IND.METALURG PAREDES S.A.	CAM MELIPILLA 9236	STGO	CERRILLOS	5571651
		110	3843	5	1	ADOLFO NUDMAN LERNER	COMPANIA 4368	SANTIAGO	QTA. NOPRMAL	7733088
		111	3843	5	2	IND.COMERCIAL COLCHAGUA LTDA.	COMPANIA 4270	STGO	QTA NORMAL	7732973
		112	3844	5	4	FABISA S A	AMERICO VESPUCIO 1851	SANTIAGO	RENCA	6018855
		390								
	390	113	3901	5	6	CASA DE MONEDA DE CHILE	AVDA PORTALES 3586	SANTIAGO	EST CENTRAL	6891034
		114	3909	5	2	CARLOS ABRAHAM MILED Y CIA LTDA	CHACABUCO 40	SANTIAGO	SANTIAGO	68140430

Factories with 100 to 199 employees

		Nro.	CIIU	Tamaño	Org Jur	NOMBRE EMP	DIRECCION	CIUDAD	COMUNA	TELEFONO
High Potential Industries	3211	1	3211	4	2	HILANDERIA SAN JOAQUIN LTDA.	SALESIANOS 550	SANTIAGO	SAN JOAQUIN	5523257
		2	3211	4	4	IND TEXTIL LA REINA S A	TIL-TIL 2756	STGO	MACUL	2382963
		3	3211	4	4	INDUSTRIA TEXTIL LANERA S A	AVDA V MACKENNA 3030	SANTIAGO	MACUL	5529819
		4	3211	4	4	MANUF TEXTILES FIBRATEX S A	A VESPUCIO 0311	STGO	CERRILLOS	5331081
		5	3211	4	4	MANUFACTURAS TEXTILES ERGAS S A	C GONGORA 1706	STGO	INDEPENDENCI	7375156
		6	3211	4	4	P Y P TINTORERIA INDUSTRIAL S A	AVDA. PDTE. FREI M.9315	SANTIAGO	QUILICURA	6233890
		7	3211	4	4	TEJEDURIAS AMERICANAS S.A.	LOS OLMOS 3160	STGO.	MACUL	2384331
		8	3211	4	2	TINTORERIA IND FUAD HIRMAS HIJOS LT	BELISARIO PRATS 1850	STGO	INDEPENDENCI	7370133
	3231	9	3231	4	4	SOC COM Y DE INV DEL CARMEN S A	CAMINO MELIPILLA 2185	STGO	EST CENTRAL	6831184
	3319	10	3319	4	2	ALDUNATE Y CIA LTDA.	TARMA TAMBO 2706	SANTIAGO	INDEPENDENCI	7368899
	341	11	3412	4	2	IND GRAFICAS MONACO Y CIA LTDA	MARTIN DE SOLIER 4539	SANTIAGO	CERRILLOS	6832200
		12	3419	4	4	CHILENA DE MOLDEADOS S A CHIMOLSA	JOSE LUIS COO 01162	SANTIAGO	PUENTE ALTO	8503065
	3420	13	3420	4	2	ARTES GRAFICAS LTDA	LUIS MONTANER 504	STGO	PROVIDENCIA	2227854
		14	3420	4	2	AZOCAR MULTICOPIAS LTDA	HUERFANOS 1922	SANTIAGO	SANTIAGO	6955400
		15	3420	4	4	RHEIN CHILE S.A.	AVDA. VICUNA MACKENNA 3333	SANTIAGO	SAN JOAQUIN	5520123
	351	16	3511	4	4	AGA CHILE S A	PASEO PDTE ERRAZURIZ ECHAURR.2	SANTIAGO	PROVIDENCIA	2328711
		17	3511	4	2	QUIMICA METALURGICA LTDA C P A	SANTA ESTER 748	SANTIAGO	SAN MIGUEL	5521599
		18	3513	4	4	QUIMICA INDUSTRIAL S A	LAS ROSAS 5757	STGO	CERRILLOS	5571085
	352	19	3521	4	4	PINTURAS QUIMICAS IRIS S A I C	PANAMERICANA NORTE 3990	SANTIAGO	RENCA	5418577
		20	3521	4	4	SOC QUIMICA NACIONAL SOQUINA S.A.	PEDRO A GONZALEZ 3702	SANTIAGO	EST CENTRAL	6834026
		21	3522	4	2	ABBOTT LAB DE CHILE LTDA	AV CERRILLOS 602	STGO	CERRILLOS	5576062
		22	3522	4	7	LABORATORIO PFIZER DE CHILE	CAM MELIPILLA 9978	STGO	CERRILLOS	5572157
		23	3522	4	2	MERCK QUIMICA CHILENA SOC LTDA	F DE PAULA T 1981	STGO	NUNOA	2381160
		24	3522	4	2	QUIMICA HOECHST CHILE LTDA	TEATINOS 449	SANTIAGO	SANTIAGO	6991434
		25	3522	4	4	SCHERING DE CHILE S.A.	AV QUILIN 3550	STGO	MACUL	2215516
		26	3522	4	2	THE SYDNEY ROSS CO & CIA LTDA	AV QUILIN 5273	SANTIAGO	PENALOLEN	2214525
		27	3523	4	4	AEROSOL S A	9 E WILLIAMS 389	SANTIAGO	CERRILLOS	5578580
		28	3523	4	4	LABORATORIO PETRIZZIO S A	MARIN 388	SANTIAGO	SANTIAGO	2223311
		29	3529	4	4	I.C.I. EXPLOSIVOS CHILE S.A.	AV. PROVIDENCIA 2237 PISO 6	SANTIAGO	PROVIDENCIA	
	354	30	3540	4	4	DERIVADOS DE PETROLEO S A	PANAMERICANA NORTE 5951	SANTIAGO	CONCHALI	6232488
		31	3540	4	4	DYNAL INDUSTRIAL S.A.	5 DE ABRIL 4534	SANTIAGO	EST CENTRAL	7795503
	355	32	3551	4	4	IND RECUP DE NEUMATICOS SACE I	PANAM NORTE 3011	STGO	CONCHALI	7341738
		33	3559	4	2	CAUCHO TECNICA LTDA	BARON DE JURAS REALES 5296	SANTIAGO	CONCHALI	6231528

	34	3559	4	2	GOMAS INDUSTRIALES HEWITT LTDA.	F ROA 5746	SANTIAGO	LA FLORIDA	2214647
	35	3559	4	2	MANUFACTURAS DE CAUCHO BLASMAR LTDA	LOS QUILLAYES 66	SANTIAGO	LA FLORIDA	2813560
356	36	3560	4	2	ANTICORROSIVOS INDUSTRIALES LTDA	AVDA. LA DIVISA 0689	SANTIAGO	SAN BERNARDO	5581133
	37	3560	4	4	DURATEC S A	AV. PEDRO ALESSANDRI 10900	SANTIAGO	SAN BERNARDO	5270027
	38	3560	4	4	ETERSOL S.A	AV. ELIODORO YANEZ 2809	SANTIAGO	PROVIDENCIA	2319751
	39	3560	4	4	IND ELECTRONICAS CONDENSA S A	AVDA. ARGENTINA 2698	ARICA	ARICA	222284
	40	3560	4	2	PLASTICOS CHIARELLA LTDA.	MAULE 811	SANTIAGO	SANTIAGO	5515905
	41	3560	4	4	PLASTICOS GLORIA S A	EUSEBIO LILLO 537	SANTIAGO	SANTIAGO	7378065
	42	3560	4	4	PLASTICOS NACIONALES PLANSA S A	CARLOS VALDOVINOS 473	SANTIAGO	SAN JOAQUIN	5513664
	43	3560	4	4	POLYMER S A	V MACKENNA 2585	SANTIAGO	SAN JOAQUIN	5529100
	44	3560	4	2	PVC ENVASES LTDA	SAN JUAN 4695	SANTIAGO	SAN JOAQUIN	5524553
	45	3560	4	4	REICOLITE S.A.	C VALDOVINOS 109	SANTIAGO	SAN JOAQUIN	5525958
	46	3560	4	2	SOC DE ELEMENTOS PLASTICOS LTDA	MATTA 1052	STGO	SANTIAGO	5416131
	47	3560	4	2	TECNIPLAST CHH S.A.	LOS 3 ANTONIOS 2190	STGO	MACUL	2390674
362	48	3620	4	4	MACKENNA Y MACKENNA S.A.	LAS ARAUCARIAS 2801	STGO	QUILICURA	6230102
3699	49	3699	4	4	COM E INDUSTRIAL ISESA S A	AV PEDRO AGUIRRE CERDA 4693	SANTIAGO	MAIPU	5332233
371	50	3710	4	4	FUNDICION LAS ROSAS S A	ROSAS 2987	SANTIAGO	SANTIAGO	6813684
	51	3710	4	4	IND DE ACEROS ESPECIALES S A	CARLOS SAGE 096	STGO	QTA. NORMAL	6812059
	52	3710	4	4	TALLERES METALURGICOS CHILE S A	ALVAREZ DE TOLEDO 764	SANTIAGO	SAN MIGUEL	5527908
372	53	3721	4	2	SOC MIN PUDAHUEL LTDA Y CIA C P A	RICARDO LYON 527	STGO	PROVIDENCIA	2341514
381	54	3811	4	4	METALURGICA ODIS S A	PORTO SEGURO 4395	STGO	QTA. NORMAL	7756511
	55	3812	4	4	LUMINOTECNIA S.A.	SAN NICOLAS 730	SANTIAGO	SAN MIGUEL	5521692
	56	3813	4	4	IND DE ALUMINIOS S.A. INDALUM	AYSEN 244	SANTIAGO	MACUL	2391221
	57	3813	4	4	IND PROCES DE ACERO S A (IPAC)	ALTE RIVEROS 1876	SANTIAGO	SAN BERNARDO	8571771
	58	3813	4	2	SOCOMETAL LTDA	ALBERTO PEPPER 1621	SANTIAGO	RENCA	6418599
	59	3814	4	4	ALUMINIO LAS AMERICAS S A I	AV LAS AMERICAS 951	STGO	CERRILLO	5572350
	60	3814	4	2	CONSTRUCCIONES Y MONTAJES LTDA	MARURI 1988	SANTIAGO	RENCA	6413027
	61	3814	4	4	ENVASES ORLANDINI S A C I	GRAL GANA 1350	STGO		55678430
	62	3814	4	4	INDUSTRIA CODIGAS S.A.	CAMINO MELIPILLA 11.000	SANTIAGO	MAIPU	5578870
	63	3814	4	4	POMOS INDUSTRIA METALURGICA S A	LOS GOBELINOS 2597	STGO	RENCA	6418606
	64	3815	4	4	ACMA ACEROS ALTA RESISTEN.MALLAS SA	AV. SENADOR JAIME GUZMAN 3609	STGO	RENCA	6411011
	65	3815	4	4	TECBOLT S.A.	AV R. FREIRE 5760	STGO	EST. CENTRAL	7762226
	66	3819	4	2	MEYER HNOS LTDA	P DE VALDIVIA 6100	STGO	MACUL	2383015
382	67	3829	4	4	IND TERMOMETALURGICA S A	SAN JUAN 4666	SANTIAGO	SN JOAQUIN	5524045
	68	3829	4	2	MAESTRANZA DIESEL LTDA	SANTA ELENA 1433	SANTIAGO	SANTIAGO	5567439
	69	3829	4	4	METALURGICA REVESOL S A	LOS 3 ANTONIOS 2170	STGO	MACUL	2381112

		70	3829	4	4	MIMET S A	CARLOS VALDOVINOS 590	SANTIAGO	SAN JOAQUIN	5514104
		71	3829	4	4	REFRIGERACION FRIO LUX S A I	GRAL MACKENNA 1920	SANTIAGO	SANTIAGO	6983096
	383	72	3831	4	4	ASEA BROWN BOVERI S A	V MACKENNA 1602	STGO	NUNOA	5550051
		73	3831	4	2	TRANSFORMADORES TUSAN LTDA	AV R FREIRE 6030	STGO	EST CENTRAL	7797636
		74	3839	4	4	GOODYEAR DE CHILE S A I C	CAM A MELIPILLA S/N KM 16	STGO	MAIPU	5356990
		75	3839	4	4	PHILIPS CHILENA S A	CAMINO A MELIPILLA 11030	SANTIAGO	MAIPU	7770038
	384	76	3843	4	4	FILTROS MARTICORENA S.A.	AVDA LO OVALLE 0178	SANTIAGO	LA CISTERNA	5212719
		77	3849	4	4	TERMOKOHN S A	R DE ARAYA 2433	STGO		2380031
	385	78	3851	4	4	CIA CHILENA DE MEDIDORES S A	GRAL FREIRE 725	SANTIAGO	LA CISTERNA	5251031
		79	3852	4	4	IND OPTICA RODENSTOCK CHILE S A	AVDA BEAUCHEFF 1581	SANTIAGO	SANTIAGO	6837550
	390	80	3909	4	4	ARTEL S A I C	MATIAS COUSIÑO 64 OF 01	SANTIAGO	SANTIAGO	6969347

Factories with 50 to 99 employees

		Nro.	CIIU	Tamaño	Org. Jur	NOMBRE_EMP	DIRECCION	CIUDAD	COMUNA	TELEFONO
High Potential Industries	351	1	3512	2	4	PROD QUIMICA TANAX S.A.C.I.	FRANKLIN 741	STGO	STGO	5550001
		2	3512	1	2	AGROQUIMICA VOLKE LTDA	AVDA TUCAPEL 2125	SANTIAGO	LA PINTANA	2092113
		3	3512	3	2	LABORATORIO BARIK Y CIA LTDA	CAMINO LO SIERRA 02572	LO ESPEJO	SAN BERNARDO	5582981
		4	3512	2	2	DEGESCH DE CHILE LTDA	CAMINO ANTIGUO A VALPARAISO 13	SANTIAGO	PENAFLOR	8111568
	62536	5	62531	2		ESTACION SERVICIOS BLANCO EXPOSICION LIM	BLANCO ENCALADA 3199		SANTIAGO	6892144
		6	62531	1		ZANETTA Y VISSCHER LIMITADA	PANAMERICANA NORTE 633		INDEPENDENCIA	0
		7	62531	3		DITRIBUIDORA TAJAMAR LTDA.	AVDA ANDRES BELLO 1255		PROVIDENCIA	2357835
		8	62531	3		ESTACION DE SERVICIO KENNEDY LTDA	AVDA KENNEDY 7100		LAS CONDES	2128967
		9	62531	3		JORGE TACCHI Y CIA LTDA	AVDA GRECIA 451		?U?OA	2391810
		10	62531	5		LEPE Y ALAMO LTDA.	AVDA OSSA 591		LA REINA	2265714
		11	62531	2		DISTRIBUIDORA DE COMBUSTIBLES Y LUBRICAN	DR CARLOS ARANDA 6058		MAIPU	0
		12	62531	1		RODRIGUEZ RODRIGUEZ JOSE RAUL	PEDRO AGUIRRE CERDA 1370		LAMPA	8441452
	95201	13	95200	1		MONTENEGRO RODRIGUEZ JULIA ELSA	ARTURO PRAT 2060		SANTIAGO	0
		14	95200	4		ALDO COLOMBO DEL FRATI Y CIA LTDA	CORONEL ALVARADO 2565		CONCHALI	7777813
		15	95200	3		ANDRES CIBIE Y CIA. LTDA.	LUIS THAYER OJEDA 331		PROVIDENCIA	2316376
		16	95200	2		LAVASECO MAESTRELLI LTDA	VITACURA 4065		VITACURA	2083804
		17	95200	1		LAVASECO APOQUINDO LTDA	AVDA APOQUINDO 5415		LAS CONDES	5512100
		18	95200	3		LAVASECO LUTECIA LTDA.	AVDA IRARRAZAVAL 2137		?U?OA	2237015
		19	95200	4		LAVACENTER EXPRESS S. A.	LOS CANTEROS 8723		LA REINA	2731135
		20	95200	3		TINTORERIAS L ART PARISIEN CIBIE Y CIA L	RODRIGO DE ARAYA 59		SAN JOAQUIN	5528739
		21	95200	1		APRESTO SANDRICO S. A.	C MELIPILLA 8181		CERRILLOS	5574133
		22	95200	3		LAVANDERIA INDUSTRIAL Y TINTORERIA SANTA	LAS ENCINAS 480		CERRILLOS	5579000
		23	95200	6		LAV. Y LIMP.LE GRAND CDE SANTIAGO S.A.	CAMINO MELIPILLA 8207		CERRILLOS	5574067

C.5 Outcome and Findings of the Factories' Survey

C.5.1 Outcome

a. Database

Data obtained from questionnaires (both the Team's Factory Survey and EWI's RISNOR study) and processed in this Study are compiled in a "database". The "data base" contains data from total of 425 factories (189 out of 199 factories surveyed by the Team, and 236 out of 265 factories surveyed by EWI's RISNOR study.).

i. The data summarized from both studies (Team's Factory Survey and EWI's RISNOR study) are compiled in two files (i.e. JEWI_IND.DBF and JEWI_DB.DBF).

ii. The data summarized exclusively from Team's Factory Survey are compiled in another set of two files (i.e. JICA_IND.DBF and JICA_DB.DBF).

Use instructions and notes for these 4 files are mentioned below in Spanish. This "data base" is submitted to the Chilean counterpart in form of a floppy disk (2HD, 1.44MB formatted, 3.5").

"Identification of present SW generation amount" and "estimation of future SW generation amount" is indispensable to initiate planning of SWM (either municipal, industrial or medical) and to revise the plan based on its monitoring.

The Team strongly wishes that the Chilean side fully utilizes the data base submitted for their reviewing current ISW generation in certain intervals, subsequently it would like to enable the Chilean authorities to review the Master Plan periodically and revise and refine their policies regarding the ISWM.

Resumen de las Bases de Datos sobre encuestas de las condiciones actuales de los desechos Industriales.

Las siguientes bases de datos contienen datos de 425 industrias de las cuales 236 industrias fueron encuestadas por EWI y 189 Industrias encuestadas por la JICA.

JEWI_IND.DBF Este Archivo contiene datos generales de las Industrias encuestas y contiene los siguientes campos.

Campo	Descripción
RUT	Rut de las Industrias
EMP	K = Industrias Encuestadas por JICA E = Industrias Encuestadas por EWI
NRO	Nro. asignado por el equipo de Estudio de la Jica para identificar a las industrias. Solo tienen los registros de las industrias encuestadas por la JICA
CIIU	Codigo CIIU
CIIU_A	Codigo CIIU Agrupado
CATEG	A=Industrias con alto Potencial B=Industrias con Potencial C=Industrias con Bajo Potencial
COMPANY	Nombre de la Industria
ADDRESS	Direccion de las Industrias
PROVIN	Provincia
COMUNA	Comuna
N_EMPL	Numero de Empleado
INTERVIE	Entrevistado
OBS	Observaciones
PHONE	Nro. de Telefono

JEWI_DB.DBF Este archivo contiene datos sobre volumen de desechos industriales generados por las industrias y contiene los siguientes campos.

Campo	**Descripción**
EMP	K = Industrias Encuestadas por JICA E = Industrias Encuestadas por EWI
NRO	Nro. asignado por el equipo de Estudio de la Jica para localizar las empresas. Solo tienen los registros de las industrias encuestadas por la JICA
RUT	Rut de las Industrias Encuestadas
CIIU	Codigo CIIU
CIIU_A	Codigo CIIU Agrupado
CODE	Codigo de Residuo
CANT	Cantidad de Residuo generado (tonelada/mes)
CLS	Clasificacion de Residuos asignado por el equipo de Estudio de la JICA
HAZ	N=Residuos No Peligrosos H=Residuos Peligrosos L=Residuos Liquidos

Las siguientes bases de datos contienen datos de 189 industrias encuestadas por la JICA.

JICA_IND.DBF Este archivo contiene datos generales sobre 189 industrias encuestadas por la JICA y contiene los siguientes campos.

Campo	Descripción
N°	Nro. asignado por el equipo de estudio de la JICA para localizar las empresas. Solo tienen los registros de las industrias encuestadas por la JICA
RUT	Rut de las industrias encuestadas
CIIU	Codigo CIIU
CIIU_A	Codigo CIIU agrupado
CAT	A=Industrias con alto potencial B=Industrias con potencial C=Industrias con bajo potencial
COMPANY	Nombre de la industria
ADDRESS	Dirección de las industrias
Provin	Provincia
Comuna	Comuna
N_EMPL	Numero de empleado de la industria
Empl_cat	Categoria de numero de empleado
Capital	Capital
A_sales	Monto de ventas anuales (millones de Pesos)
Prod_tn	Produccion de productos principales (toneladas/año)
Prod_m3	Produccion de productos principales (m3/año)
Raw_tn	Demanda de materias primas (toneladas/año)
Raw_m3	Demanda de materias primas (m3/año)
Water_m3	Consumo de Agua (m3/año)
Power_kw	Consumo de electricidad (kwh/año)
Fuel_tn	Consumo de combustibles (toneladas/año)
Fuel_kl	Consumo de combustibles (kl/año)
Intervie	Entrevistado
Position	Titulo o cargo
Phone	Telefono

JICA_DB.DBF Este archivo contiene datos sobre volumen de desechos industriales generados por las 189 industrias encuestadas por la JICA y contiene los siguientes campos.

EMP	K = Industrias Encuestadas por JICA - E = Industrias Encuestadas por EWI	
Nro	Nro. asignado por el equipo de Estudio de la Jica para localizar las empresas. Solo tienen los registros de las industrias encuestadas por la JICA	
RUT	Rut de las Industrias	
Ciiu	CIIU	
CIIU_A	CIIU agrupado	
CATEG	A=Industrias con alto Potencial - B=Industrias con Potencial - C=Industrias con Bajo Potencial	
CODE	Codigo de residuo	
CANT	Volumen generado (tonelada/mes)	
CLS	Clasificacion de Residuos asignado por el equipo de Estudio de la JICA	
HAZ	N=Residuos No Peligrosos - H=Residuos Peligrosos - L=Residuos Liquidos	
A	Tratamiento	Si/No
B		1. Deshidratación 2. Secado y/o evaporación 3. Neutralización 4. Reducción 5. Incineración 6. Molienda 7. Clasificación 8. Separación de Aceite 9. Solidificación 10. Reutilización 11. Otros
C		Porcentaje
D	Volumen anual de desechos	Volumen del codigo
E	después de tratamiento	Volumen al codigo
F	Método de disposición	1. Transporte y disposición final en botaderos municipales po medios de transporte propios. 2. Transporte y disposición final en botaderos municipales por contratistas privados. 3. Disposición final en fábrica o terreno propio. 4. Almacenamiento de largo plazo en fábrica a la espera de un tratamiento/disposición externo. 5. Descarga al alcantarillado o curso de agua. 6. Depósito encargado a un cotratista privado - tratamiento y disposición desconocido. 7. Reutilización por terceros, p. ej. uso en otras fábricas como materia prima. 8. otros.
G		Porcetaje
H	Compañia responsable	Transporte
I	del tratamiento y deposito externo	Tratamiento/depósito
J	Costo del tratamiento	Transporte
K	externo y deposito	Tratamiento
L	peso/mes	Depósito
M	Sustancias	Hg
N	Peligrosas	Pb
O		Cr
P		Cd
Q		As
R		CN
S		PCB
T		Solventes
U		Componentes orgánicos fosforados
V		Otros
W	Almacenamiento separado Si/No	

b. List of factories surveyed

From a total 267 factories contacted, the Study Team carried out an interview survey of 199 factories (the remaining factories in general were not willing to answer, claiming how repetitive this practice was) mainly from manufacturing industries, and some from mining, electricity generation, retail trade and personal and household services (e.g. gas stations and laundries). The 199 factories surveyed are categorized according to the CIIU code and tabulated in Table C.5.1a. Detailed information is available in the Data Book A.2.

Table C.5.1a List of Factories Surveyed

Industrial Category		Nos. of Employees							Grand Total
		>500	200-499	100-199	50-99	10-49	<10	NA	
Highly	351	0	1	2	2	1	0	0	6
Potential	352	5	5	7	2	3	0	0	22
Industries	354	0	0	1	1	1	1	0	4
	356	1	4	6	1	0	0	0	12
	371	0	3	3	1	0	0	0	7
	372	1	3	0	0	0	0	0	4
	381	1	16	14	0	1	0	0	32
	352	0	0	0	0	0	0	4	4
	356	0	0	0	0	0	0	1	1
Total Highly Potential Industries		8	32	33	7	6	1	5	92
Potential	3211	3	5	8	0	0	0	0	16
Industries	3231	0	2	1	1	0	0	0	4
	3319	0	0	1	0	0	0	0	1
	341	4	5	1	0	0	0	0	10
	3420	3	4	1	0	0	0	0	8
	355	0	2	2	0	0	0	0	4
	362	1	1	1	0	0	0	0	3
	3699	0	1	1	0	0	0	0	2
	382	3	0	3	1	0	0	0	7
	383	1	5	1	0	0	0	0	7
	384	1	2	2	0	0	0	0	5
	385	0	0	2	0	0	0	0	2
	390	0	0	1	0	0	0	0	1
	625	0	0	0	0	2	1	0	3
	952	0	0	0	1	5	2	0	8
	384	0	0	0	0	0	0	1	1
	3211	0	0	0	0	0	0	1	1
	355	0	0	0	0	0	0	1	1
	362	0	0	0	0	0	0	1	1
Total Potential Industries		16	27	25	3	7	3	4	85
Less	311	7	2	0	0	0	0	0	9
Potential	313	3	0	0	0	0	0	0	3
Industries	3212 - 3219	1	0	0	0	0	0	0	1
	322	2	2	0	0	0	0	0	4
	324	2	0	0	0	0	0	0	2
	3691 - 3696	1	0	0	0	0	0	0	1
	410	0	0	0	1	0	0	0	1
	322	0	0	0	0	0	0	1	1
Total Less Potential Industries		16	4	0	1	0	0	1	22
Grand Total		40	63	58	11	13	4	10	199

Note: NA = Number of factories di not give their number of employees

c. Effective samples

Numbers of effective samples for the respective data analysis are listed below.

Table C.5.1b Effective Samples for Each Items

Items	Sub-Items	Effective Answers	Unit	Total
Rut Number		199		
Name of Company		199		
Address	Provincia	199		
	Comuna	199		
	Address	199		
Category of Industry	Procciff Code	199		
Main Product	Production	167	(tn/year)	3,509,304.20
		7	(m3/year)	4,876,811.00
	Input of Raw Material	171	(tn/year)	2,734,616.78
		6	(m3/year)	621,164.20
Share Capital		109	(mill. Pesos)	1,521,885.40
Number of Employees		189	(People)	64,784.00
Anual Sales Amount		118	(mill. Pesos)	1,063,274.56
Use of Raw Material		199		
Production Process		199		
Pollution Control Facilities		199		
Water Consumption		178	(m3/year)	51,146,795.00
Power Consumption		183	(kw/year)	913,791,383.00
Fuel Consumption		42	(tn/year)	2,638,664.37
		136	(kl/year)	17,168,137.52
Present Managment of Hazardous Waste	6.1	148		
	6.2	121		
	6.3	148		
	7.1	132		
	7.2	131		
	7.3	154		
	7.4	160		
	7.5	147		
	7.6	128		

d. General Data

The general data of factories surveyed are presented in Tables C.5.1c and C.5.1d. The effective answers corresponding to the number of employees covered 189 factories, with a total of 64,784 employees. The effective answers for the share capital and annual sales are 109 and 118 respectively. The effective answers on the output of main products and input of raw materials are 174 and 177 respectively.

The location of the factories are tabulated in Tables C.5.1e and C.5.1f, and illustrated in Figures C.5.1a and C.5.1b.

e. Flow Chart of Processes and Materials

The flow chart of processes and materials was completed by all the sample of surveyed industries, even though differences exist in the level of detail of the completed diagrams. Those are in the Survey Sheet.

Table C.5.1c General Data of Factories Surveyed No.1

Industrial Category		Nos. Employees	Share Capital (mill. Pesos)	Anual Sales (mill. Pesos$)
HIGHLY	351	676	-	6,352
POTENTIAL	352	6,815	53,057	66,416
INDUSTRIES	354	285	3,769	5,972
	356	2,891	929,669	29,798
	371	1,547	70,002	26,956
	372	2,017	13,848	33,425
	381	7,370	52,804	112,981
Total Highly Potential Industries		21,601	1,123,149	281,899
POTENTIAL	3211	5,915	41,742	55,637
INDUSTRIES	3231	690	1,088	3,000
	3319	120	-	-
	341	4,538	38,681	75,415
	3420	3,793	36,570	62,398
	355	722	2,792	8,722
	362	1,030	53,857	36,636
	3699	348	2,029	3,272
	382	3,201	2,693	51,811
	383	2,265	39,076	55,074
	384	2,177	5,412	4,970
	385	276	3,841	5,355
	390	126	-	-
	625	39	-	600
	952	193	820	1,152
Total Potential Industries		25,433	228,601	364,042
LESS	311	6,762	17,048	124,951
POTENTIAL	313	2,663	109,120	147,127
INDUSTRIES	3212 - 3219	730	1,176	10,262
	322	4,251	26,210	65,393
	324	2,701	5,381	50,200
	3691 - 3696	548	11,200	19,400
	410	95	-	-
Total Less Potential Industries		17,750	170,135	417,333
TOTAL		64,784	1,521,885	1,063,275

Table C.5.1d General Data of Factories Surveyed No.2

Industrial Category		Output of Main Products (Tn/Year)	Output of Main Products (m3/year)	Input of Raw Material (tn/year)	Input of Raw Material (m3/year)
HIGHLY	351	6,758	-	13,222	-
POTENTIAL	352	257,952	4,708,200	484,167	2
INDUSTRIES	354	167,150	123,600	172,420	3,640
	356	68,134	1,000	84,412	-
	371	91,288	-	133,314	-
	372	24,360	-	111,462	-
	381	416,056	-	318,653	-
Total Highly Potential Industries		1,031,698	4,832,800	1,317,649	3,642
POTENTIAL	3211	27,638	-	21,759	-
INDUSTRIES	3231	956	-	6,626	-
	3319	1,000	-	1,000	-
	341	312,315	-	289,252	-
	3420	82,462	-	101,790	-
	355	6,020	-	5,760	-
	362	128,100	-	156,671	-
	3699	2,684	-	2,464	-
	382	22,932	-	24,341	-
	383	304,831	-	10,113	-
	384	146,945	-	5,518	4
	385	270,033	-	63	-
	390	-	-	-	-
	625	122,400	5,011	-	-
	952	3,122	-	3,204	-
Total Potential Industries		1,431,437	5,011	628,561	4
LESS	311	262,608	39,000	301,154	19
POTENTIAL	313	773,944	-	371,385	617,499
INDUSTRIES	3212 - 3219	838	-	710	-
	322	3,779	-	3,688	-
	324	5,000	-	3,650	-
	3691 - 3696	-	-	107,170	-
	410	-	-	650	-
Total Less Potential Industries		1,046,169	39,000	788,407	617,518
TOTAL		3,509,304	4,876,811	2,734,617	621,164

Table C.5.1e Location of Factories Surveyed in Province

		Province						
Category	CIIU_A	Santiago	Chacabuco	Cordillera	Maipo	Melipilla	Talagante	TOTAL
HIGHLY	351	5	0	0	0	0	1	6
POTENTIAL	352	24	1	0	1	0	0	26
INDUSTRIES	354	4	0	0	0	0	0	4
	356	10	0	0	3	0	0	13
	371	4	0	0	3	0	0	7
	372	4	0	0	0	0	0	4
	381	29	0	0	3	0	0	32
Total Highly Potential Industries		80	1	0	10	0	1	92
POTENTIAL	3211	16	0	1	0	0	0	17
INDUSTRIES	3231	4	0	0	0	0	0	4
	3319	1	0	0	0	0	0	1
	341	8	1	0	0	0	1	10
	3420	7	0	1	0	0	0	8
	355	4	0	0	1	0	0	5
	362	4	0	0	0	0	0	4
	3699	2	0	0	0	0	0	2
	382	7	0	0	0	0	0	7
	383	7	0	0	0	0	0	7
	384	5	0	0	1	0	0	6
	385	2	0	0	0	0	0	2
	390	1	0	0	0	0	0	1
	625	2	1	0	0	0	0	3
	952	8	0	0	0	0	0	8
Total Potential Industries		78	2	2	2	0	1	85
LESS	311	5	0	0	3	1	0	9
POTENTIAL	313	3	0	0	0	0	0	3
INDUSTRIES	3212 - 3219	1	0	0	0	0	0	1
	322	5	0	0	0	0	0	5
	324	1	0	0	0	0	1	2
	3691 - 3696	1	0	0	0	0	0	1
	410	1	0	0	0	0	0	1
Total Less Potential Industries		17	0	0	3	1	1	22
TOTAL		175	3	2	15	1	3	199

Category	Province						
	Santiago	Chacabuco	Cordillera	Maipo	Melipilla	Talagante	TOTAL
Highly Potential Industries	40%	1%	0%	5%	0%	1%	46%
Potential Industries	39%	1%	1%	1%	0%	1%	43%
Less Potential Industries	9%	0%	0%	2%	1%	1%	11%
Total	88%	2%	1%	8%	1%	2%	100%

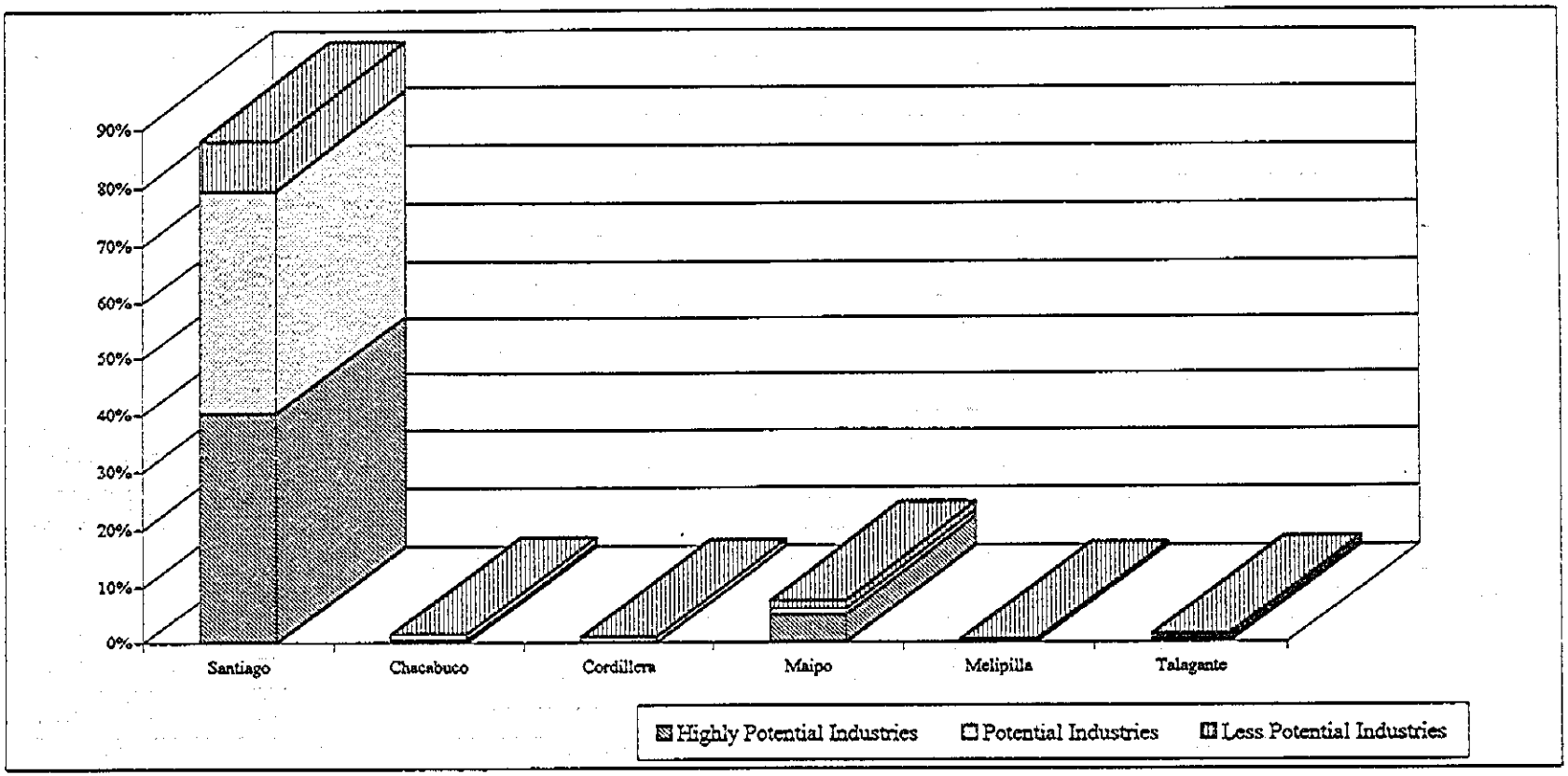


Figure C.5.1a Location of Factories Surveyed in Province

Table C.5.1f Location of Factories Surveyed in Santiago Province

		SANTIAGO PROVINCE																									TOTAL
Category		1-01	1-02	1-03	1-04	1-05	1-06	1-09	1-10	1-11	1-12	1-13	1-14	1-15	1-18	1-19	1-20	1-22	1-24	1-25	1-26	1-27	1-29	1-31	1-32	
HIGHLY	351	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	5
POTENTIAL	352	2	0	1	0	1	1	0	4	0	1	1	0	1	0	0	0	0	2	4	1	3	0	2	0	24
INDUSTRIES	354	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	4
	356	0	0	0	1	2	0	0	0	0	2	0	0	2	0	0	0	0	0	0	1	0	0	0	2	10
	371	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	1	0	4
	372	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	0	1	0	0	4
	381	0	0	0	1	0	0	0	0	0	2	0	0	2	1	3	0	0	3	3	7	2	0	3	2	29
Total Highly Potential Industries		4	0	2	2	3	1	0	5	0	5	1	0	6	1	6	0	0	6	10	11	6	1	6	4	80
POTENTIAL	3211	2	2	0	0	1	0	0	0	0	7	0	0	1	0	0	0	0	0	0	1	0	0	1	1	16
INDUSTRIES	3231	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	4
	3319	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	341	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	1	0	0	1	8
	3420	2	0	0	0	0	1	0	2	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	7
	355	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0	4
	362	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	4
	3699	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2
	382	3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	1	7
	383	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	3	1	0	0	0	0	7
	384	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	0	5
	385	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	2
	390	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
	625	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
	952	1	1	0	0	0	2	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8
Total Potential Industries		15	3	1	0	2	4	2	4	1	12	0	1	3	0	3	3	1	5	5	5	2	0	2	4	78
LESS	311	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1	0	5
POTENTIAL	313	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	3
INDUSTRIES	3212 - 3219	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	322	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5
	324	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	3691 - 3696	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
	410	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Total Less Potential Industries		2	3	0	0	1	0	1	1	0	1	0	0	1	0	0	0	0	0	1	2	0	0	2	2	17
TOTAL		21	6	3	2	6	5	3	10	1	18	1	1	10	1	9	3	1	11	16	18	8	1	10	10	175

Note:

1-01	Santiago	1-06	Providencia	1-11	La Reina	1-16	La Granja	1-21	El Bosque	1-26	Maipu	1-31	Renca
1-02	Independencia	1-07	Vitacura	1-12	Macul	1-17	La Pintana	1-22	P. Aguirre Cerda	1-27	Quinta Normal	1-32	Quilicura
1-03	Conchali	1-08	Lo Barnechea	1-13	Penalolen	1-18	San Ramon	1-23	Lo Espejo	1-28	Lo Prado		
1-04	Huechuraba	1-09	Las Condes	1-14	La Florida	1-19	San Miguel	1-24	Estacion Central	1-29	Pudahuel		
1-05	Recoleta	1-10	Nunoa	1-15	San Joaquin	1-20	La Cisterna	1-25	Cerrillos	1-30	Cerro Navia		

	SANTIAGO PROVINCE																								TOTAL
	1-01	1-02	1-03	1-04	1-05	1-06	1-09	1-10	1-11	1-12	1-13	1-14	1-15	1-18	1-19	1-20	1-22	1-24	1-25	1-26	1-27	1-29	1-31	1-32	
Highly Potential Industries	2%	0%	1%	1%	2%	1%	0%	3%	0%	3%	1%	0%	3%	1%	3%	0%	0%	3%	6%	6%	3%	1%	3%	2%	46%
Potential Industries	9%	2%	1%	0%	1%	2%	1%	2%	1%	7%	0%	1%	2%	0%	2%	2%	1%	3%	3%	3%	1%	0%	1%	2%	45%
Less Potential Industries	1%	2%	0%	0%	1%	0%	1%	1%	0%	1%	0%	0%	1%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	1%	10%
Total	12%	3%	2%	1%	3%	3%	2%	6%	1%	10%	1%	1%	6%	1%	5%	2%	1%	6%	9%	10%	5%	1%	6%	6%	100%

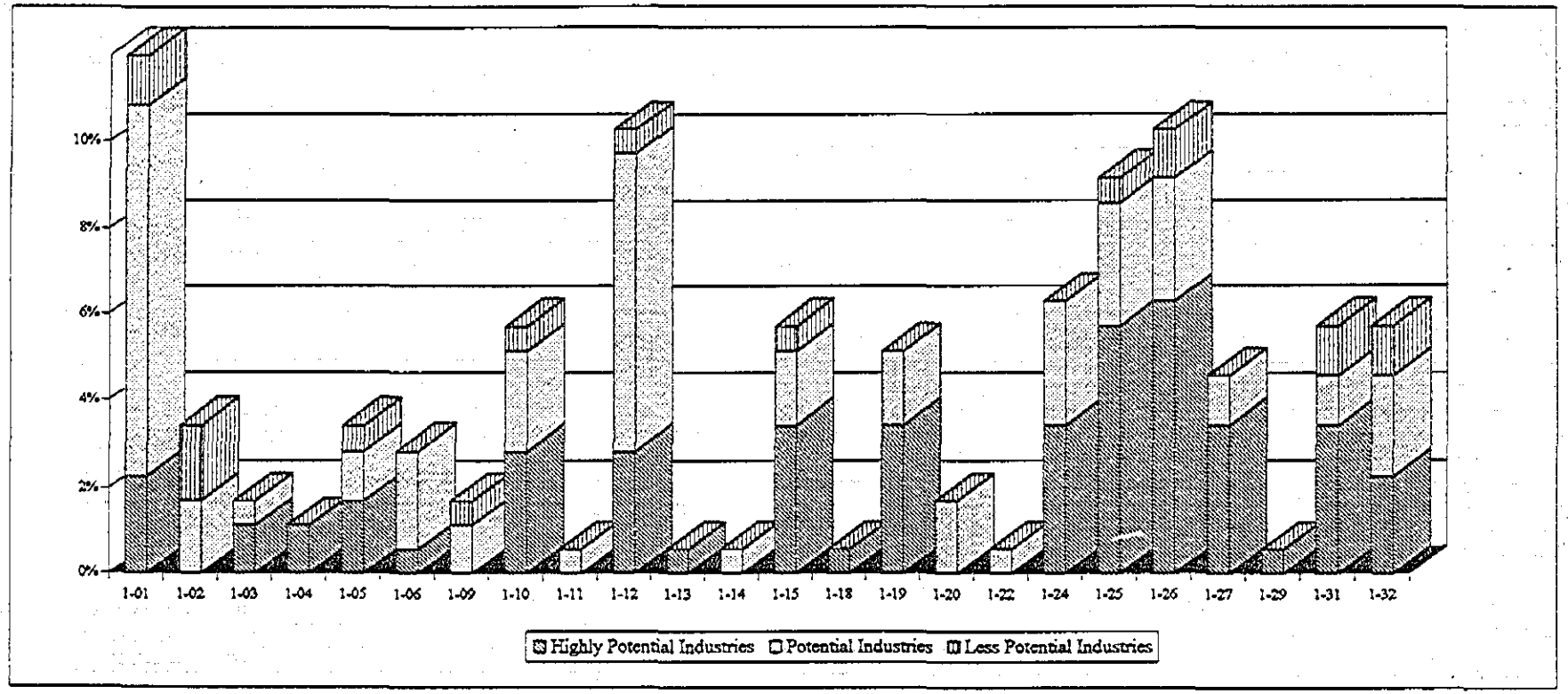


Figure C.5.1b Location of Factories Surveyed in Santiago Province

f. Production

fa. Use of raw materials

With regard to the use of raw materials which may either be hazardous and/or contain such materials when it becomes a by-product, the result is the following (see Figure C.5.1c and Table C.5.1g):

- Only 18% of the industries utilize heavy metal(s) in their production processes.
- 57% of the surveyed industries utilizes industrial solvents, mainly hydrocarbons such as benzene, petroleum ether, and among others, acetones, alcohols, perchloroethylene, trichloromethane, toluene, methyl acetate and dichloromethane.
- 51% of the sampled industries utilizes some kind of acid, mostly inorganic acids such as sulfuric acid and hydrochloric acid. Among the organic acids used in smaller proportions are formic, acetic, oxalic, citric acid, etc..
- The industries that utilize some kind of pigments, generally of vegetal origin, correspond to 50% of the surveyed sample.
- 66% of the factories of the samples use oils, which can be classified according to the CIIU industry code, as edible oils (natural or hydrogenated), and as lubricating and/or refrigerating oils, by-products of petroleum.
- From the industry samples, only 6% use asbestos as a raw material in their productive process and 54% uses some other kind of organic or inorganic chemical.

Table C.5.1g Use of Raw Material by Category of Industries

Industrial Category	CIIU_A	Nos. of Survey Industries	Heavy Metals	%	Solvents	%	Acids	%	Alkalis	%	Pigments	%	Oils	%	Asbestos	%	Others	%
High	351	6	1	17%	3	50%	4	67%	3	50%	1	17%	3	50%	0	-	3	50%
Potential	352	26	1	4%	19	73%	15	58%	14	54%	19	73%	21	81%	0	-	20	77%
Industries	354	4	0	-	2	50%	2	50%	1	25%	1	25%	1	25%	1	25%	3	75%
	356	13	1	8%	9	69%	3	23%	3	23%	9	69%	7	54%	0	-	5	38%
	371	7	3	43%	5	71%	1	14%	2	29%	1	14%	5	71%	0	-	3	43%
	372	4	3	75%	3	75%	2	50%	2	50%	2	50%	2	50%	0	-	2	50%
	381	32	12	38%	15	47%	17	53%	11	34%	13	41%	24	75%	4	13%	14	44%
Total High Potential Industries		92	21	23%	56	61%	44	48%	36	39%	46	50%	63	68%	5	5%	50	54%
Potential	3211	17	1	6%	6	35%	15	88%	13	76%	14	82%	12	71%	0	-	13	76%
Industries	3231	4	3	75%	3	75%	3	75%	3	75%	3	75%	3	75%	0	-	2	50%
	3319	1	0	-	1	100%	0	-	0	-	0	-	0	-	0	-	0	-
	341	10	1	10%	6	60%	4	40%	3	30%	4	40%	5	50%	0	-	5	50%
	3420	8	3	38%	5	63%	5	63%	3	38%	6	75%	6	75%	1	13%	3	38%
	355	5	0	-	3	60%	1	20%	0	-	4	80%	5	100%	0	-	2	40%
	362	4	0	-	1	25%	3	75%	3	75%	3	75%	3	75%	0	-	1	25%
	3699	2	0	-	1	50%	0	-	0	-	0	-	1	50%	1	50%	2	100%
	382	7	1	14%	6	86%	4	57%	3	43%	2	29%	5	71%	1	14%	2	29%
	383	7	2	29%	4	57%	4	57%	4	57%	4	57%	5	71%	0	-	3	43%
	384	6	2	33%	6	100%	3	50%	2	33%	4	67%	5	83%	1	17%	2	33%
	385	2	0	-	0	-	1	50%	0	-	1	50%	2	100%	0	-	1	50%
	390	1	0	-	1	100%	0	-	0	-	1	100%	1	100%	0	-	1	100%
	625	3	0	-	0	-	0	-	0	-	0	-	1	33%	0	-	0	-
	952	8	0	-	6	75%	1	13%	2	25%	2	25%	1	13%	0	-	6	75%
Total Potential Industries		85	13	15%	49	58%	44	52%	36	42%	48	56%	55	65%	4	5%	43	51%
Less	311	9	1	11%	3	33%	6	67%	4	44%	3	33%	6	67%	1	11%	4	44%
Potential	313	3	0	-	0	-	2	67%	3	100%	0	-	1	33%	0	-	3	100%
Industries	3212 - 3219	1	0	-	1	100%	1	100%	1	100%	0	-	1	100%	0	-	0	-
	322	5	0	-	2	40%	2	40%	1	20%	0	-	3	60%	0	-	4	80%
	324	2	0	-	2	100%	1	50%	1	50%	2	100%	2	100%	0	-	2	100%
	3691 - 3696	1	0	-	0	-	0	-	0	-	1	100%	0	-	1	100%	0	-
	410	1	0	-	0	-	1	100%	1	100%	0	-	0	-	0	-	1	100%
Total Less Potential Industries		22	1	5%	8	36%	13	59%	11	50%	6	27%	13	59%	2	9%	14	64%
Grand Total		199	35	18%	113	57%	101	51%	83	42%	100	50%	131	66%	11	6%	107	54%

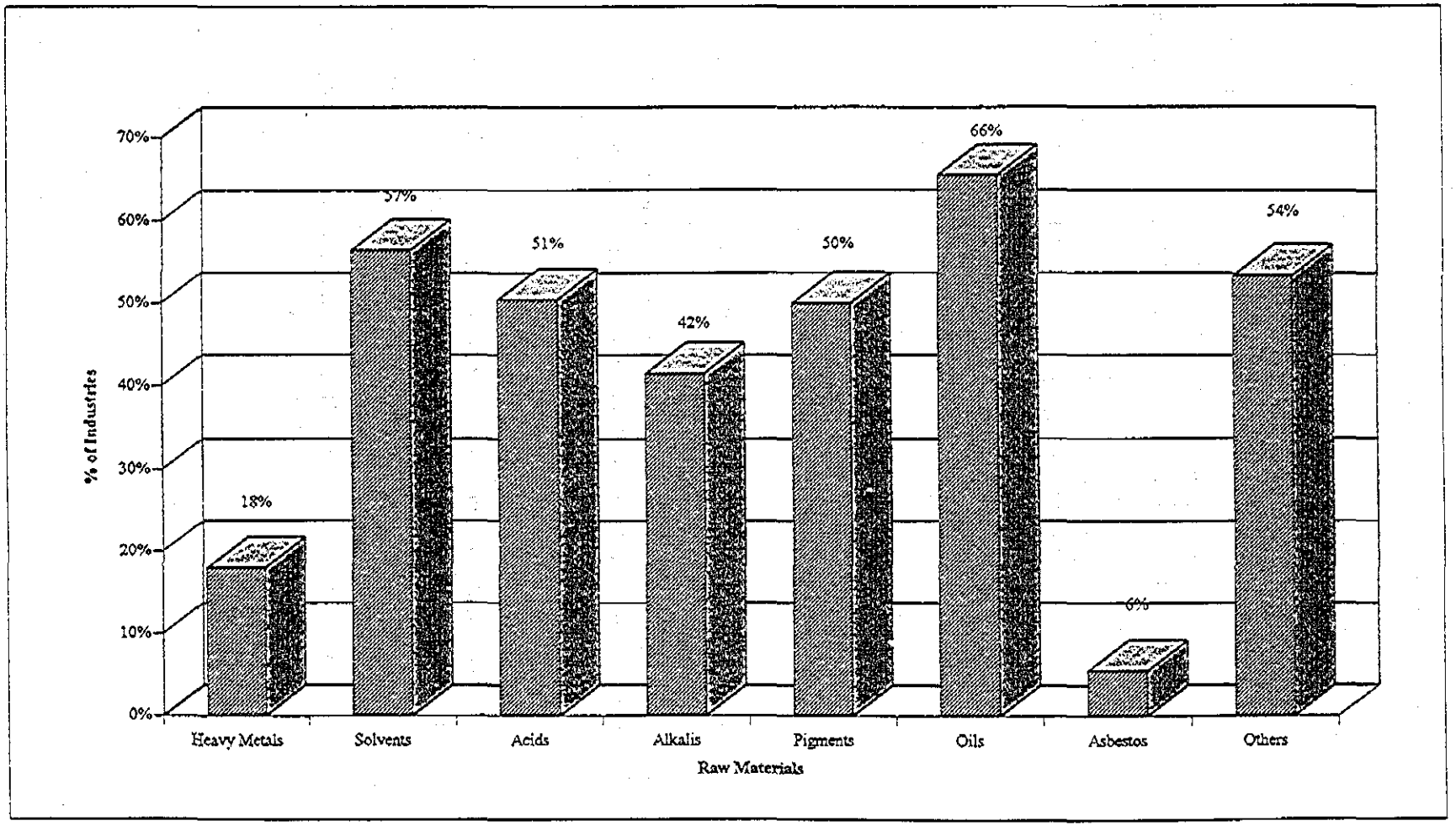


Figure C.5.1c Use of Raw Materials

fb. Production Process

The production process of factories surveyed is summarized and illustrated in Figure C.5.1d.

- Thermic processes, such as boilers, furnaces, heating, incineration etc., are used by 82% of the surveyed sample.
- From the sample of surveyed industries, 81% use water in its productive processes.
- Specific installations: 58% of the sample of industries has some kind of specific installation for the storage of liquid chemicals, such as solvents, acids, alkalis, oils, etc. The installations are usually tanks, under or above-ground, and warehouses for inflammables, reactives, etc.

fc. Pollution control facilities

The existing and planned pollution control facilities are presented in Figure C.5.1e.

As for the installation rate of pollution control facilities of sample factories, the present and planned installation rates of the facilities are summarized in Table C.5.1h. The rates are for factories which have thermic processes and use water in their production processes. The installation rate of the flue gas treatment facilities among those which have thermic processes (i.e. boilers, incinerator, etc.) is 38%; 62 among 164 factories.

Although the installation rate of the waste water treatment facilities is 52 % (83 factories), only 5 factories generate C-3 (Inorganic sludge) and C-4 (Organic sludge) is produced by 21. The remaining 57 factories have only primary treatment facilities (e.g. simple ponds, screen, etc.) which do not generate sludge. Consequently the installation rate of waste water treatment facilities which generate sludge is 16% (26/161 x 100 = 16%).

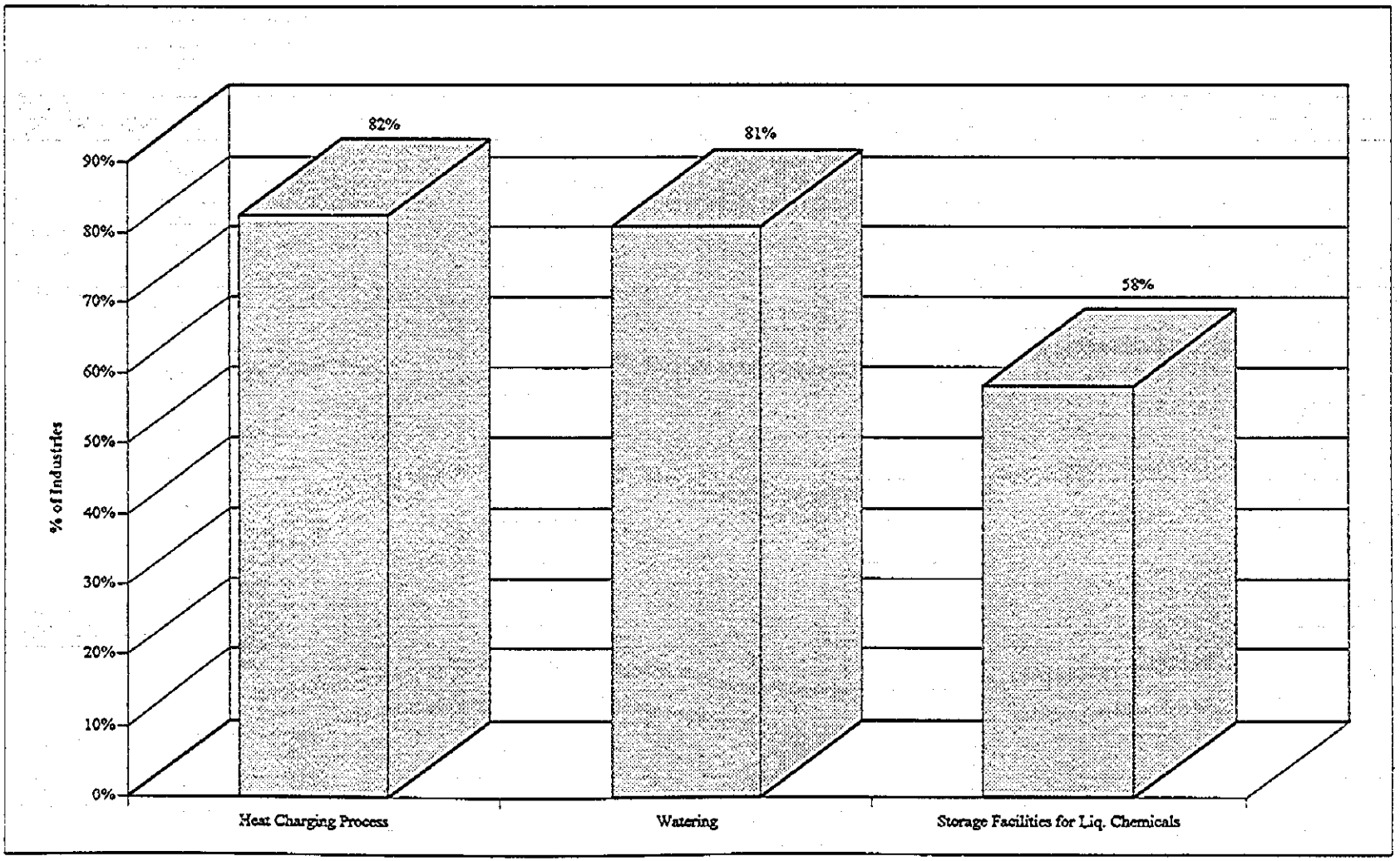


Figure C.5.1d Production Process

Table C.5.1h Present and Planned Rates of Pollution Control Facilities

Industrial Category	CITU Code	Nos. of Surveyed Industries	Production Process						Pollution Control Facilities											
									Existing						Planned					
			Nos. of Industries With HCP	Rate of Industries With HCP	Nos of Industries With Watering	Rate of Industries With Watering	Storage Facilities for Liquid Chemicals	Rate (%)	Nos. of Factories With FGT	Rate (%)	Nos. of Factories With WWT	Rate (%)	Other	Rate (%)	Nos. of Factories With FGT	Rate (%)	Nos. of Factories With WWT	Rate (%)	Other	Rate (%)
Highly Potential Industries	351	6	5	83%	4	67%	4	67%	1	20%	1	25%	2	50%	0	0%	0	0%	1	25%
	352	26	22	85%	25	96%	23	88%	6	27%	11	44%	7	30%	3	14%	4	16%	0	0%
	354	4	4	100%	2	50%	3	75%	2	50%	1	50%	0	0%	0	0%	1	50%	0	0%
	356	13	7	54%	10	77%	8	62%	1	14%	3	30%	2	25%	0	0%	1	10%	0	0%
	371	7	7	100%	7	100%	2	29%	7	100%	1	14%	1	50%	3	43%	0	0%	1	50%
	372	4	3	75%	4	100%	3	75%	2	67%	2	50%	1	33%	1	33%	1	25%	1	33%
	381	32	27	84%	23	72%	18	56%	11	41%	15	65%	1	6%	3	11%	7	30%	1	6%
Total Highly Potential Industries		92	75	82%	75	82%	61	66%	30	40%	34	45%	14	23%	10	13%	14	19%	4	7%
Potential Industries	3211	17	15	88%	16	94%	14	82%	5	33%	6	38%	3	21%	2	13%	4	25%	2	14%
	3231	4	2	50%	2	50%	2	50%	1	50%	4	200%	0	0%	0	0%	2	100%	0	0%
	3319	1	1	100%	0	0%	1	100%	1	100%	0	0%	1	100%	0	0%	0	0%	0	0%
	341	10	7	70%	7	70%	4	40%	3	43%	5	71%	1	25%	1	14%	4	57%	0	0%
	3420	8	7	88%	7	88%	2	25%	0	0%	1	14%	2	100%	2	29%	2	29%	1	50%
	355	5	5	100%	5	100%	2	40%	1	20%	1	20%	1	50%	2	40%	0	0%	1	50%
	362	4	4	100%	3	75%	2	50%	3	75%	1	33%	0	0%	1	25%	1	33%	0	0%
	3699	2	2	100%	1	50%	0	0%	1	50%	1	100%	1	0%	1	50%	1	100%	1	0%
	382	7	5	71%	6	86%	3	43%	4	80%	3	50%	1	33%	1	20%	2	33%	0	0%
	383	7	6	86%	4	57%	1	14%	3	50%	5	125%	0	0%	0	0%	1	25%	0	0%
	384	6	4	67%	4	67%	4	67%	1	25%	3	75%	1	25%	0	0%	1	25%	0	0%
	385	2	2	100%	1	50%	1	50%	1	50%	0	0%	0	0%	0	0%	1	100%	1	100%
	390	1	0	0%	1	100%	0	0%	0	0%	1	100%	0	0%	0	0%	0	0%	1	0%
	625	3	0	0%	2	67%	0	0%	0	0%	2	100%	1	0%	0	0%	0	0%	0	0%
	952	8	8	100%	8	100%	4	50%	0	0%	2	25%	1	25%	0	0%	1	13%	0	0%
Total Potential Industries		85	68	80%	67	79%	40	47%	24	35%	35	52%	13	33%	10	15%	20	30%	7	18%
Less Potential Industries	311	9	8	89%	7	78%	5	56%	3	38%	7	100%	3	60%	1	13%	3	43%	0	0%
	313	3	3	100%	3	100%	3	100%	3	100%	1	33%	1	33%	2	67%	3	100%	0	0%
	3212 - 3219	1	1	100%	1	100%	1	100%	0	0%	0	0%	0	0%	1	100%	1	100%	0	0%
	322	5	5	100%	4	80%	3	60%	1	20%	4	100%	0	0%	1	20%	2	50%	1	33%
	324	2	2	100%	2	100%	2	100%	0	0%	0	0%	1	50%	0	0%	0	0%	0	0%
	3691 - 3696	1	1	100%	1	100%	0	0%	0	0%	1	100%	1	0%	0	0%	1	100%	0	0%
	410	1	1	100%	1	100%	1	100%	1	100%	1	100%	0	0%	0	0%	0	0%	0	0%
Total Less Potential Industries		22	21	95%	19	86%	15	68%	8	38%	14	74%	6	40%	5	24%	10	53%	1	7%
Grand Total		199	164	82%	161	81%	116	58%	62	38%	83	52%	33	28%	25	15%	44	27%	12	10%

Note:
HCP (Heat Charging Process)
FGT (Flue Gas Treatment)
WWT (Waste Water Treatment)

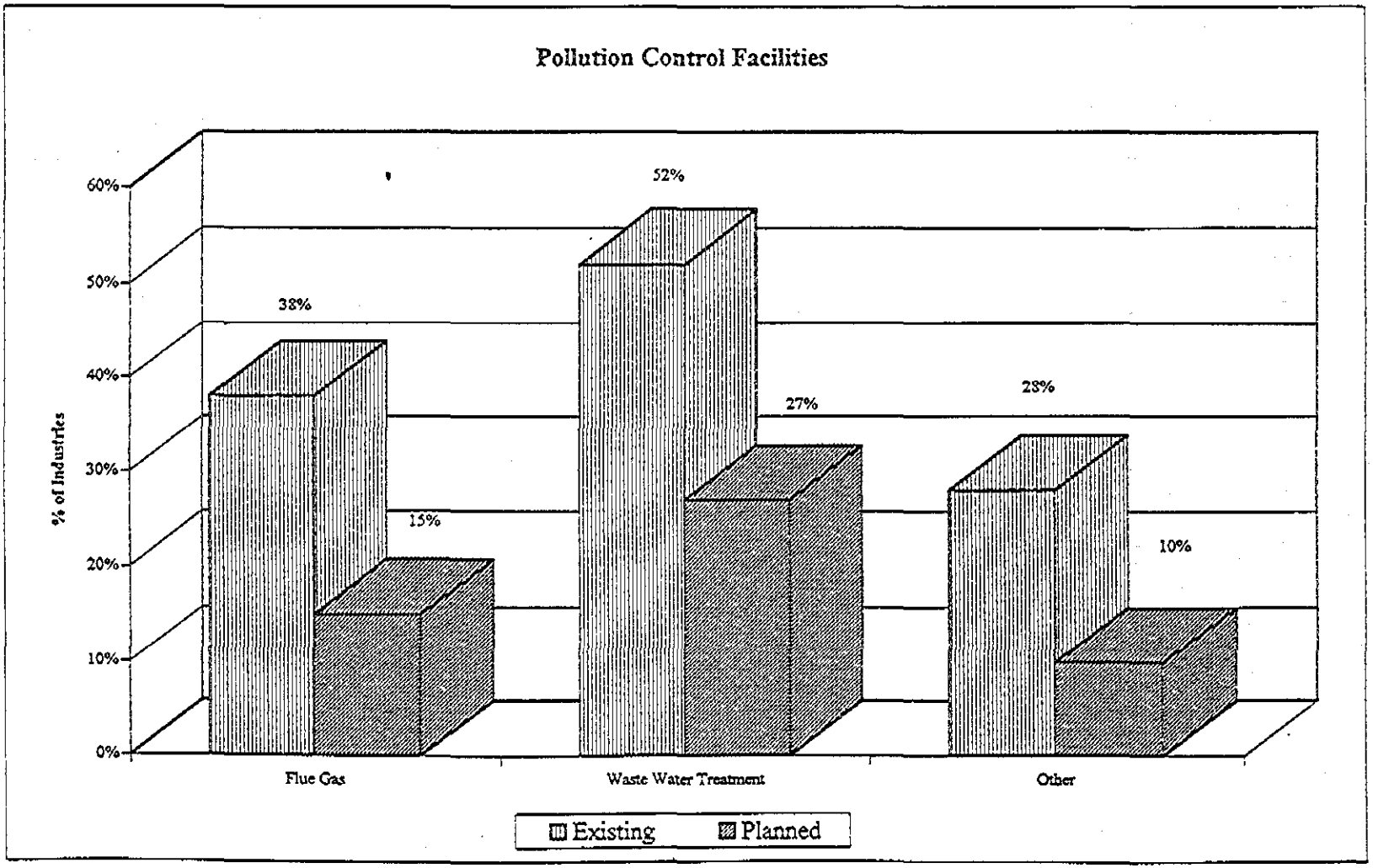


Figure C.5.1e Existing and Planned Pollution Control Facilities

fd. Demand of Water/Energy

Demand of water/energy is summarized in Table C.5.1i. The total consumption of water, for the 178 industries that responded, is 51.1 million m^3/year. For the power consumption, 183 industries consume 914 Gwh/year of electricity. With regard to the consumption of fuel, 42 and 136 industries consume 2.6 million tons/year of fuel and 17 million Kl/year of fuel respectively. Liquid fuel is primarily petroleum and LPG.

Table C.5.1i Demand of Water and Energy

Industrial Category		Consumption		Fuel Consumption	
		Water (m3/year)	Power (kw/year)	(tn/year)	Fuel (kl/year)
HIGHLY	351	284,220	2,831,846	480	1,144
POTENTIAL	352	2,183,874	31,655,384	7,266	239,310
INDUSTRIES	354	104,000	4,264,800	1,200	840
	356	252,345	33,212,780	333	23,221
	371	729,492	115,753,600	5,000	604,509
	372	539,504	61,028,600	3,900	4,238
	381	1,319,519	44,396,000	88	4,103,644
Total Highly Potential Industries		5,412,954	293,143,010	18,267	4,976,906
POTENTIAL	3211	15,885,965	80,803,960	4,301	2,612,598
INDUSTRIES	3231	350,787	1,635,300	146	440
	3319	3,750	60,000	-	10
	341	16,759,914	225,906,759	38,000	664,203
	3420	342,921	25,728,733	446,828	2,454,146
	355	373,728	7,244,900	-	1,696
	362	127,895	41,782,987	18,002	4,743,304
	3699	69,672	2,452,800	-	262
	382	658,763	15,267,124	1,350	72,202
	383	635,419	25,009,100	70	1,546,721
	384	226,551	2,939,356	1,566	431
	385	51,281	1,423,200	-	24,073
	390	1,680	300,000	-	165
	625	4,737	92,260	-	-
	952	703,012	821,832	-	3,506
Total Potential Industries		36,196,075	431,468,311	510,262	12,123,758
LESS	311	3,600,351	112,665,562	2,102,271	48,524
POTENTIAL	313	5,260,000	37,763,100	7,864	1,763
INDUSTRIES	3212 - 3219	192,000	6,000,000	-	687
	322	284,000	5,171,400	-	1,389
	324	39,415	10,480,000	-	12,800
	3691 - 3696	162,000	17,100,000	-	2,311
	410	-	-	-	-
Total Less Potential Industries		9,537,766	189,180,062	2,110,135	67,474
TOTAL		51,146,795	913,791,383	2,638,664	17,168,138

g. Treatment and final disposal in factories

ga. Internal treatment methods

In order to identify the internal treatment methods used in the factories surveyed, the following methods are inquired by questionnaire :

1. Dewatering
2. Drying and/or Evaporation
3. Neutralization
4. Reduction
5. Incineration
6. Crushing
7. Sorting
8. Oil Separation
9. Solidification
10. Reutilization
11. Others

According to the results of the survey (see Tables C.5.1k and C.5.1j), most of ISW (82.6%) generated on-site are not treated. Among the treated ISW (17.4%), 10.1% of them are recycled on-site. Thus, only 7.3% of ISW generated are treated on-site (at the factory). Popular treatment methods on-site are neutralization (2.8%), sorting (1.8%) and drying/evaporation (1.7%) in order and the other methods are negligible. Regarding treatment methods on-site by factories (refer to Tables C.5.1l and C.5.1m), there are no significant difference observed in the industrial category of HPI (Highly Potential Industries), PI (Potential Industries) and LPI (Less Potential) Industries.

gb. Disposal methods

The following disposal methods on-site were surveyed by questionnaire in order to identify the destination of generated waste from factories ;

1. Transport and final disposal at municipal landfill by own means of transportation.
2. Transport and final disposal at municipal landfill by consignment of private contractor.
3. Final disposal at factory's compound and/or its property land.
4. Long-time storage at factory's compound awaiting external treatment/disposal.

5. Discharge to sewer or watercourse.
6. Disposal consigned to private contractor-treatment and disposal is not known.
7. Reutilization by other parties, e.g. use at other factory as raw materials.
8. Others

The results of the survey according to the 24 ISW categories are summarized in Tables C.5.1n and C.5.1o. According to the results, it is significant that 56.2% of ISW generated are recycled and 25.5% of ISW are transported to the municipal landfills. It is surprising that 95.6% of C-13 (Waste from food production) and 94.4% of C-21 (Wood) are recycled. It indicates that some of HW, i.e. 78.2% of C-10 (Inorganic chemical residues) 71.9% of C-7 (Alkalis) and 22.9% of C-8 (Solvents), are discharged into sewer or watercourse. In addition, while rate of long-term storage on-site is very limited including some of HW (0.8%), considerable portion of HW, i.e. 100% of C-5 (Asbestos), 96.9% of C-4 (Organic sludge) and 78.0% of C-11 (Organic chemical residues), are disposed of at municipal landfills.

Referring to the results by industrial category (see Tables C.5.1p and C.5.1q), it is quite reasonable that recycling rates according to the HPI, PI and LPI are 29.8%, 53.8% and 73.9% respectively. The fact is also supported by the result that disposal rate at municipal landfills of ISW from LPI is only 8.7% while the rate from HPI and PI is about 36%. On the other hand, 12.4% of ISW generated in HPI are discharged into sewer or watercourse, while rates of ISW discharged from PI and LPI are only 0.1% and 4.1% respectively. This is a critical issue to be solved urgently.

Table C.5.1j Treatment Methods On-site by 24 ISW Categories (Amount obtained)

Unit: ton/month

ISW Category		Treatment Methods												
		1	2	3	4	5	6	7	8	9	10	11	(blank)	Grand Total
C-1	Ash including from incinerator	-	25.0	-	-	-	-	55.0	-	-	-	-	43.7	123.7
C-2	Dust and APC products	-	12.5	0.3	-	0.6	-	-	-	-	99.0	6.2	21.6	140.2
C-3	Inorganic sludge	-	284.3	-	-	-	-	-	-	-	-	-	300.5	584.8
C-4	Organic sludge	2.8	-	5.4	-	-	-	-	-	-	330.0	28.2	528.4	894.8
C-5	Asbestos	-	-	-	-	-	-	-	-	-	-	-	15.0	15.0
C-6	Acids	-	-	40.1	-	-	-	-	-	-	-	-	412.7	452.8
C-7	Alkalis	-	-	63.3	-	-	-	-	-	-	-	8.5	9.7	81.5
C-8	Solvents	-	-	-	-	-	-	-	-	-	6.5	0.1	7.4	13.9
C-9	Oily waste	-	-	-	-	0.7	-	-	0.1	0.0	-	1.8	27.7	30.3
C-10	Inorganic chemical residues	-	-	400.0	-	-	-	-	-	-	0.1	-	426.5	826.6
C-11	Organic chemical residues	12.0	-	5.0	-	-	-	-	-	-	60.0	-	223.6	300.6
C-12	Other liquid waste	-	-	-	-	-	-	-	-	-	134.6	-	-	134.6
C-13	Waste from food production	-	-	-	-	-	-	46.9	-	-	-	6.4	5,095.7	5,149.0
C-14	Glass and ceramics	-	-	-	-	-	0.1	40.2	-	-	559.3	-	587.0	1,186.6
C-15	Metal and scrap	-	-	-	-	-	0.5	34.9	-	-	31.0	5.0	1,351.1	1,422.5
C-16	Paper and cardboard	-	-	-	0.1	-	0.1	10.8	-	-	20.1	8.0	2,688.7	2,727.7
C-17	Plastics	-	-	-	-	-	5.0	100.1	-	-	31.0	88.0	414.0	638.1
C-18	Rubber	-	-	-	-	-	5.0	-	-	-	8.0	-	256.7	269.7
C-19	Textile and leather	-	-	-	-	-	10.0	4.3	-	-	-	-	237.9	252.2
C-20	Waste similar to domestic waste	-	-	1.1	-	0.3	-	0.2	-	-	-	1.2	1,080.9	1,083.7
C-21	Wood	-	-	-	-	-	-	36.2	-	-	0.0	-	1,252.8	1,288.9
C-22	Slag form melting	-	-	-	-	-	-	-	-	10.0	75.0	-	376.0	461.0
C-23	Construction Waste	-	-	-	-	-	-	0.2	-	-	1.0	-	28.4	29.6
C-24	Other solid waste	-	-	-	-	-	-	-	-	-	524.0	-	0.0	524.0
Grand Total		14.8	321.8	515.3	0.1	1.5	20.7	328.7	0.1	10.0	1,879.7	153.4	15,385.9	18,631.8

Note:
1. Dewatering
2. Drying and /or Evaportion
3. Neutralization
4. Reduction
5. Incineration
6. Crushing
7. Sorting
8. Oil Separation
9. Solidification
10. Reutilization
11. Other

Table C.5.1k Treatment Methods On-site by 24 ISW Categories (Rate obtained)

Unit: %

ISW Category		E												
		1	2	3	4	5	6	7	8	9	10	11	(blank)	Grand Total
C-1	Ash including from incinerator	-	20.2%	-	-	-	-	44.5%	-	-	-	-	35.3%	100%
C-2	Dust and APC products	-	8.9%	0.2%	-	0.4%	-	-	-	-	70.6%	4.4%	15.4%	100%
C-3	Inorganic sludge	-	48.6%	-	-	-	-	-	-	-	-	-	51.4%	100%
C-4	Organic sludge	0.3%	-	0.6%	-	-	-	-	-	-	36.9%	3.2%	59.0%	100%
C-5	Asbestos	-	-	-	-	-	-	-	-	-	-	-	100.0%	100%
C-6	Acids	-	-	8.9%	-	-	-	-	-	-	-	-	91.1%	100%
C-7	Alkalis	-	-	77.7%	-	-	-	-	-	-	-	10.4%	11.9%	100%
C-8	Solvents	-	-	-	-	-	-	-	-	-	46.8%	0.4%	52.7%	100%
C-9	Oily waste	-	-	-	-	2.3%	-	-	0.3%	0.1%	-	5.8%	91.5%	100%
C-10	Inorganic chemical residues	-	-	48.4%	-	-	-	-	-	-	0.0%	-	51.6%	100%
C-11	Organic chemical residues	4.0%	-	1.7%	-	-	-	-	-	-	20.0%	-	74.4%	100%
C-12	Other liquid waste	-	-	-	-	-	-	-	-	-	100.0%	-	-	100%
C-13	Waste from food production	-	-	-	-	-	-	0.9%	-	-	-	0.1%	99.0%	100%
C-14	Glass and ceramics	-	-	-	-	-	0.0%	3.4%	-	-	47.1%	-	49.5%	100%
C-15	Metal and scrap	-	-	-	-	-	0.0%	2.5%	-	-	2.2%	0.4%	95.0%	100%
C-16	Paper and cardboard	-	-	-	0.0%	-	0.0%	0.4%	-	-	0.7%	0.3%	98.6%	100%
C-17	Plastics	-	-	-	-	-	0.8%	15.7%	-	-	4.9%	13.8%	64.9%	100%
C-18	Rubber	-	-	-	-	-	1.9%	-	-	-	3.0%	-	95.2%	100%
C-19	Textile and leather	-	-	-	-	-	4.0%	1.7%	-	-	-	-	94.3%	100%
C-20	Waste similar to domestic waste	-	-	0.1%	-	0.0%	-	0.0%	-	-	-	0.1%	99.7%	100%
C-21	Wood	-	-	-	-	-	-	2.8%	-	-	0.0%	-	97.2%	100%
C-22	Slag form melting	-	-	-	-	-	-	-	-	2.2%	16.3%	-	81.6%	100%
C-23	Construction Waste	-	-	-	-	-	-	0.7%	-	-	3.4%	-	95.9%	100%
C-24	Other solid waste	-	-	-	-	-	-	-	-	-	100.0%	-	0.0%	100%
Grand Total		0.1%	1.7%	2.8%	0.0%	0.0%	0.1%	1.8%	0.0%	0.1%	10.1%	0.8%	82.6%	100%

Note:
1. Dewatering
2. Drying and /or Evaportion
3. Neutralization
4. Reduction
5. Incineration
6. Crushing
7. Sorting
8. Oil Separation
9. Solidification
10. Reutilization
11. Other

Table C.5.11 Treatment Methods On-site by Industrial Category (Amount obtained)

Unit; ton/month

Industrial Category		Treatment Methods												Grand Total
		1	2	3	4	5	6	7	8	9	10	11	(blank)	
Highly	351	-	-	20.0	0.1	-	-	-	-	-	88.0	-	12.8	120.9
Potential	352	-	-	60.8	-	0.3	0.7	1.8	0.1	-	84.1	4.5	481.3	633.5
Industries	354	-	-	-	-	-	-	-	-	-	-	-	13.3	13.3
	356	-	-	0.0	-	-	-	-	-	-	-	0.1	125.4	125.5
	371	-	-	-	-	-	-	-	-	-	95.0	-	1,187.9	1,282.9
	372	-	-	1.8	-	-	-	-	-	10.0	9.0	18.0	75.7	114.5
	381	-	-	420.8	-	-	-	-	-	0.0	11.1	5.0	1,461.1	1,898.0
Total Highly Potential Industries		-	-	503.4	0.1	0.3	0.7	1.8	0.1	10.0	287.2	27.6	3,357.5	4,188.6
Potential	3211	-	-	1.1	-	0.2	-	-	-	-	-	0.0	104.5	105.8
Industries	3231	12.0	-	-	-	-	-	-	-	-	-	-	187.0	199.0
	3319	-	-	-	-	-	-	-	-	-	-	-	50.8	50.8
	341	-	-	-	-	-	-	-	-	-	391.0	70.0	2,006.6	2,467.6
	3420	-	-	-	-	-	-	-	-	-	8.5	8.0	1,413.8	1,430.3
	355	-	-	-	-	-	-	-	-	-	0.5	-	258.5	259.0
	362	-	-	-	-	0.5	-	15.0	-	-	206.2	-	368.1	589.8
	3699	-	-	-	-	0.6	-	-	-	-	-	-	20.0	20.6
	382	-	-	-	-	-	-	30.0	-	-	0.1	6.0	109.3	145.5
	383	-	-	3.3	-	-	-	-	-	-	372.1	-	360.3	735.7
	384	-	-	-	-	-	-	-	-	-	-	0.2	62.1	62.3
	385	-	-	-	-	-	-	-	-	-	-	-	1,058.9	1,058.9
	390	-	-	-	-	-	-	-	-	-	-	-	4.6	4.6
	625	-	-	-	-	-	-	-	-	-	-	0.2	1.8	2.0
	952	-	-	-	-	-	-	-	-	-	0.1	24.0	6.5	30.5
Total Potential Industries		12.0	-	4.4	-	1.3	-	45.0	-	-	978.5	108.4	6,012.7	7,162.2
Less	311	2.8	-	0.0	-	-	-	116.1	-	-	-	8.9	1,622.3	1,750.1
Potential	313	-	-	-	-	-	-	165.6	-	-	90.0	8.5	4,271.6	4,535.7
Industries	322	-	-	7.4	-	-	-	0.2	-	-	-	-	95.7	103.3
	324	-	-	-	-	-	20.0	-	-	-	-	-	26.1	46.1
	3691 - 3696	-	284.3	-	-	-	-	-	-	-	524.0	-	-	808.3
	410	-	37.5	-	-	-	-	-	-	-	-	-	-	37.5
Total Less Potential Industries		2.8	321.8	7.4	-	-	20.0	281.9	-	-	614.0	17.4	6,015.8	7,281.0
Grand Total		14.8	321.8	515.3	0.1	1.5	20.7	328.7	0.1	10.0	1,879.7	153.4	15,385.9	18,631.8

Note : 1. Dewatering
2. Drying and/or Evaporation
3. Neutralization
4. Reduction
5. Incineration
6. Crushing
7. Sorting
8. Oil Separation
9. Solidification
10. Reutilization
11. Other

Table C.5.1m Treatment Methods On-site by Industrial Category (Rate obtained)

Unit: %

Industrial Category		Treatment Methods												Grand Total
		1	2	3	4	5	6	7	8	9	10	11	(blank)	
Highly	351	-	-	16.5%	0.1%	-	-	-	-	-	72.8%	-	10.6%	100.0%
Potential	352	-	-	9.6%	-	0.0%	0.1%	0.3%	0.0%	-	13.3%	0.7%	76.0%	100.0%
Industries	354	-	-	-	-	-	-	-	-	-	-	-	100.0%	100.0%
	356	-	-	0.0%	-	-	-	-	-	-	-	0.1%	99.9%	100.0%
	371	-	-	-	-	-	-	-	-	-	7.4%	-	92.6%	100.0%
	372	-	-	1.6%	-	-	-	-	-	8.7%	7.9%	15.7%	66.1%	100.0%
	381	-	-	22.2%	-	-	-	-	-	0.0%	0.6%	0.3%	77.0%	100.0%
Total Highly Potential Industries		-	-	12.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	6.9%	0.7%	80.2%	100.0%
Potential	3211	-	-	1.0%	-	0.2%	-	-	-	-	-	0.0%	98.8%	100.0%
Industries	3231	6.0%	-	-	-	-	-	-	-	-	-	-	94.0%	100.0%
	3319	-	-	-	-	-	-	-	-	-	-	-	100.0%	100.0%
	341	-	-	-	-	-	-	-	-	-	15.8%	2.8%	81.3%	100.0%
	3420	-	-	-	-	-	-	-	-	-	0.6%	0.6%	98.8%	100.0%
	355	-	-	-	-	-	-	-	-	-	0.2%	-	99.8%	100.0%
	362	-	-	-	-	0.1%	-	2.5%	-	-	35.0%	-	62.4%	100.0%
	3699	-	-	-	-	2.7%	-	-	-	-	-	-	97.3%	100.0%
	382	-	-	-	-	-	-	20.6%	-	-	0.1%	4.1%	75.2%	100.0%
	383	-	-	0.4%	-	-	-	-	-	-	50.6%	-	49.0%	100.0%
	384	-	-	-	-	-	-	-	-	-	-	0.3%	99.7%	100.0%
	385	-	-	-	-	-	-	-	-	-	-	-	100.0%	100.0%
	390	-	-	-	-	-	-	-	-	-	-	-	100.0%	100.0%
	625	-	-	-	-	-	-	-	-	-	-	10.3%	89.7%	100.0%
	952	-	-	-	-	-	-	-	-	-	0.2%	78.6%	21.2%	100.0%
Total Potential Industries		0.2%	-	0.1%	-	0.0%	-	0.6%	-	-	13.7%	1.5%	83.9%	100.0%
Less	311	0.2%	-	0.0%	-	-	-	6.6%	-	-	-	0.5%	92.7%	100.0%
Potential	313	-	-	-	-	-	-	3.7%	-	-	2.0%	0.2%	94.2%	100.0%
Industries	322	-	-	7.2%	-	-	-	0.2%	-	-	-	-	92.6%	100.0%
	324	-	-	-	-	-	43.4%	-	-	-	-	-	56.6%	100.0%
	3691 - 3696	-	35.2%	-	-	-	-	-	-	-	64.8%	-	-	100.0%
	410	-	100.0%	-	-	-	-	-	-	-	-	-	-	100.0%
Total Less Potential Industries		0.0%	4.4%	0.1%	-	-	0.3%	3.9%	-	-	8.4%	0.2%	82.6%	100.0%
Grand Total		0.1%	1.7%	2.8%	0.0%	0.0%	0.1%	1.8%	0.0%	0.1%	10.1%	0.8%	82.6%	100.0%

Note : 1. Dewatering
2. Drying and/or Evaporation
3. Neutralization
4. Reduction
5. Incineration
6. Crushing
7. Sorting
8. Oil Separation
9. Solidification
10. Reutilization
11. Other

Table C.5.1n Disposal Methods On-site by 24 ISW Categories (Amount obtained)

Unit: ton/month

ISW Category		Disposal Methods									
		1	2	3	4	5	6	7	8	No Answer	Grand Total
C-1	Ash including from incinerator	8.0	3.7	-	-	-	32.0	80.0	-	-	123.7
C-2	Dust and APC products	0.1	22.2	-	90.0	4.3	1.5	12.5	-	9.6	140.2
C-3	Inorganic sludge	-	300.5	-	-	-	-	-	284.3	-	584.8
C-4	Organic sludge	3.3	866.7	0.7	-	-	12.3	4.0	7.9	-	894.8
C-5	Asbestos	-	15.0	-	-	-	-	-	-	-	15.0
C-6	Acids	-	0.9	13.0	4.0	26.6	0.3	360.0	48.0	0.0	452.8
C-7	Alkalis	-	-	-	4.0	58.6	-	10.4	-	8.5	81.5
C-8	Solvents	-	0.0	-	0.1	3.2	0.5	5.2	4.9	0.1	13.9
C-9	Oily waste	-	5.6	-	-	0.7	1.3	21.5	0.4	0.7	30.3
C-10	Inorganic chemical residues	-	180.0	-	-	646.5	-	0.1	-	-	826.6
C-11	Organic chemical residues	-	234.5	-	-	3.1	-	-	3.0	60.0	300.6
C-12	Other liquid waste	-	-	-	-	46.6	-	88.0	-	-	134.6
C-13	Waste from food production	-	146.9	-	-	36.4	44.0	4,920.4	1.3	-	5,149.0
C-14	Glass and ceramics	-	267.1	-	-	-	355.0	172.9	-	391.7	1,186.6
C-15	Metal and scrap	5.0	46.6	-	-	-	1.8	1,054.7	286.2	28.2	1,422.5
C-16	Paper and cardboard	16.0	402.9	-	1.5	-	104.8	2,176.0	15.3	11.2	2,727.7
C-17	Plastics	26.2	317.9	-	0.2	-	10.9	226.6	29.9	26.4	638.1
C-18	Rubber	250.0	0.6	0.5	-	-	5.0	3.0	-	10.6	269.7
C-19	Textile and leather	0.4	149.0	-	-	-	10.0	82.9	-	10.0	252.2
C-20	Waste similar to domestic waste	47.2	980.9	0.3	4.5	-	5.6	27.0	8.5	9.8	1,083.7
C-21	Wood	-	51.9	-	1.0	-	5.2	1,216.7	3.0	11.2	1,288.9
C-22	Slag form melting	189.0	188.0	-	40.0	-	16.0	18.0	-	10.0	461.0
C-23	Construction Waste	-	28.6	-	-	-	-	-	-	1.0	29.6
C-24	Other solid waste	-	-	524.0	-	0.0	-	-	-	-	524.0
Grand Total		545.2	4,209.4	538.4	145.3	826.0	606.1	10,479.8	692.6	589.0	18,631.8

Note:
1. Transport and final disposal at municipal landfill by own means of transportation.
2. Transport and final disposal at municipal landfill by consignment of private contractor.
3. Final disposal at factory's compound and/or its property land.
4. Long-time storage at factory's compound awaiting external treatment/disposal.
5. Discharge to sewer or watercourse
6. Disposal consigned to private contractor - treatment and disposal is not known.
7. Reutilization by other parties, e.g. use at other factory as raw material.
8. Others.

Table C.5.1o Disposal Methods On-Site by 24 ISW Categories (Rate obtained)

Unit: %

ISW Category		Disposal Methods									Grand Total
		1	2	3	4	5	6	7	8	No Answer	
C-1	Ash including from incinerator	6.5%	3.0%	-	-	-	25.9%	64.7%	-	-	100%
C-2	Dust and APC products	0.1%	15.8%	-	64.2%	3.1%	1.1%	8.9%	-	6.8%	100%
C-3	Inorganic sludge	-	51.4%	-	-	-	-	-	48.6%	-	100%
C-4	Organic sludge	0.4%	96.9%	0.1%	-	-	1.4%	0.4%	0.9%	-	100%
C-5	Asbestos	-	100.0%	-	-	-	-	-	-	-	100%
C-6	Acids	-	0.2%	2.9%	0.9%	5.9%	0.1%	79.5%	10.6%	0.0%	100%
C-7	Alkalis	-	-	-	4.9%	71.9%	-	12.8%	-	10.5%	100%
C-8	Solvents	-	0.1%	-	0.5%	22.9%	3.6%	37.0%	35.4%	0.4%	100%
C-9	Oily waste	-	18.6%	-	-	2.4%	4.2%	71.1%	1.3%	2.3%	100%
C-10	Inorganic chemical residues	-	21.8%	-	-	78.2%	-	0.0%	-	-	100%
C-11	Organic chemical residues	-	78.0%	-	-	1.0%	-	-	1.0%	20.0%	100%
C-12	Other liquid waste	-	-	-	-	34.6%	-	65.4%	-	-	100%
C-13	Waste from food production	-	2.9%	-	-	0.7%	0.9%	95.6%	0.0%	-	100%
C-14	Glass and ceramics	-	22.5%	-	-	-	29.9%	14.6%	-	33.0%	100%
C-15	Metal and scrap	0.4%	3.3%	-	-	-	0.1%	74.1%	20.1%	2.0%	100%
C-16	Paper and cardboard	0.6%	14.8%	-	0.1%	-	3.8%	79.8%	0.6%	0.4%	100%
C-17	Plastics	4.1%	49.8%	-	0.0%	-	1.7%	35.5%	4.7%	4.1%	100%
C-18	Rubber	92.7%	0.2%	0.2%	-	-	1.9%	1.1%	-	3.9%	100%
C-19	Textile and leather	0.2%	59.1%	-	-	-	4.0%	32.9%	-	4.0%	100%
C-20	Waste similar to domestic waste	4.4%	90.5%	0.0%	0.4%	-	0.5%	2.5%	0.8%	0.9%	100%
C-21	Wood	-	4.0%	-	0.1%	-	0.4%	94.4%	0.2%	0.9%	100%
C-22	Slag form melting	41.0%	40.8%	-	8.7%	-	3.5%	3.9%	-	2.2%	100%
C-23	Construction Waste	-	96.6%	-	-	-	-	-	-	3.4%	100%
C-24	Other solid waste	-	-	100.0%	-	0.0%	-	-	-	-	100%
Grand Total		2.9%	22.6%	2.9%	0.8%	4.4%	3.3%	56.2%	3.7%	3.2%	100%

Note:

1. Transport and final disposal at municipal landfill by own means of transportation.
2. Transport and final disposal at municipal landfill by consignment of private contractor.
3. Final disposal at factory's compound and/or its property land.
4. Long-time storage at factory's compound awaiting external treatment/disposal.
5. Discharge to sewer or watercourse
6. Disposal consigned to private contractor - treatment and disposal is not known.
7. Reutilization by other parties, e.g. use at other factory as raw material.
8. Others.

Table C.5.1p Disposal Methods On-site by Industrial Category (Amount obtained)

Unit: ton/month

Industrial Category		Disposal Methods									
		1	2	3	4	5	6	7	8	No Answer	Grand Total
Highly Potential Industries	351	0.5	10.5	-	-	0.1	0.1	109.6	0.1	0.1	120.9
	352	0.0	74.4	0.3	0.1	99.4	2.9	425.8	20.0	10.7	633.5
	354	0.3	12.8	-	-	-	-	-	0.2	-	13.3
	356	39.2	43.6	-	-	0.0	1.0	37.2	2.0	2.5	125.5
	371	204.0	713.9	-	40.0	-	301.0	-	-	24.0	1,282.9
	372	-	75.5	-	-	1.8	-	18.2	-	19.0	114.5
	381	21.9	329.8	13.0	15.2	417.6	88.7	655.6	346.4	9.9	1,898.0
Total Highly Potential Industries		265.9	1,260.5	13.2	55.3	518.9	393.6	1,246.4	368.6	66.2	4,188.6
Potential Industries	3211	1.4	53.1	0.7	-	1.0	32.0	14.0	3.4	0.2	105.8
	3231	1.8	148.2	-	-	-	-	49.0	-	-	199.0
	3319	-	-	-	-	-	-	50.8	-	-	50.8
	341	5.1	1,437.2	-	-	-	-	964.3	-	61.0	2,467.6
	3420	-	45.0	-	-	0.3	95.9	1,277.2	1.4	10.6	1,430.3
	355	254.0	0.5	0.5	-	-	-	4.0	-	-	259.0
	362	-	364.4	-	90.0	-	-	40.0	3.7	91.7	589.8
	3699	-	20.0	-	-	-	-	-	-	0.6	20.6
	382	4.0	57.2	-	-	-	-	83.4	-	0.8	145.5
	383	10.0	104.8	-	-	2.4	2.3	308.3	8.0	300.0	735.7
	384	-	9.2	-	-	-	-	53.1	-	-	62.3
	385	-	51.9	-	-	-	-	1,003.0	4.0	-	1,058.9
	390	-	-	-	-	-	-	4.6	-	-	4.6
	625	-	1.0	-	-	-	-	0.8	0.2	-	2.0
	952	0.1	26.4	-	-	4.0	-	-	0.1	-	30.5
Total Potential Industries		276.4	2,318.9	1.2	90.0	7.6	130.2	3,852.4	20.8	464.9	7,162.2
Less Potential Industries	311	2.9	204.4	-	-	0.0	62.4	1,457.1	-	23.3	1,750.1
	313	-	389.0	-	-	292.0	-	3,827.2	19.0	8.5	4,535.7
	322	-	36.6	-	-	7.4	-	59.3	-	-	103.3
	324	-	-	-	-	-	20.0	-	-	26.1	46.1
	3691 - 3696	-	-	524.0	-	-	-	-	284.3	-	808.3
	410	-	-	-	-	-	-	37.5	-	-	37.5
Total Less Potential Industries		2.9	630.0	524.0	-	299.5	82.4	5,381.1	303.3	57.9	7,281.0
Grand Total		545.2	4,209.4	538.4	145.3	826.0	606.1	10,479.8	692.6	589.0	18,631.8

Note:
1. Transport and final disposal at municipal landfill by own means of transprtation.
2. Transport and final disposal at municipal landfill by consignment of private contractor.
3. Final disposal at factory's compound and/or its property land.
4. Long-time storage at factory's compound awaiting external treatment/disposal.
5. Discharge to sewer or watercourse
6. Disposal consigned to private contractor - treatment and disposal is not known.
7. Reutilization by other parties, e.g. use at other factory as raw material.
8. Others.

Table C.5.1q Disposal Methods On-Site Surveyed by Industrial Category (Rate obtained)

Unit: %

Industrial Category		Disposal Methods									
		1	2	3	4	5	6	7	8	No Answer	Grand Total
Highly Potential Industries	351	0.4%	8.6%	-	-	0.1%	0.1%	90.7%	0.1%	0.1%	100.0%
	352	0.0%	11.7%	0.0%	0.0%	15.7%	0.4%	67.2%	3.2%	1.7%	100.0%
	354	2.5%	96.0%	-	-	-	-	-	1.5%	-	100.0%
	356	31.2%	34.8%	-	-	0.0%	0.8%	29.6%	1.6%	2.0%	100.0%
	371	15.9%	55.6%	-	3.1%	-	23.5%	-	-	1.9%	100.0%
	372	-	65.9%	-	-	1.6%	-	15.9%	-	16.6%	100.0%
	381	1.2%	17.4%	0.7%	0.8%	22.0%	4.7%	34.5%	18.2%	0.5%	100.0%
Total Highly Potential Industries		6.3%	30.1%	0.3%	1.3%	12.4%	9.4%	29.8%	8.8%	1.6%	100.0%
Potential Industries	3211	1.3%	50.2%	0.7%	-	0.9%	30.3%	13.3%	3.2%	0.2%	100.0%
	3231	0.9%	74.5%	-	-	-	-	24.6%	-	-	100.0%
	3319	-	-	-	-	-	-	100.0%	-	-	100.0%
	341	0.2%	58.2%	-	-	-	-	39.1%	-	2.5%	100.0%
	3420	-	3.1%	-	-	0.0%	6.7%	89.3%	0.1%	0.7%	100.0%
	355	98.1%	0.2%	0.2%	-	-	-	1.5%	-	-	100.0%
	362	-	61.8%	-	15.3%	-	-	6.8%	0.6%	15.5%	100.0%
	3699	-	97.3%	-	-	-	-	-	-	2.7%	100.0%
	382	2.8%	39.4%	-	-	-	-	57.3%	-	0.6%	100.0%
	383	1.4%	14.2%	-	-	0.3%	0.3%	41.9%	1.1%	40.8%	100.0%
	384	-	14.8%	-	-	-	-	85.2%	-	-	100.0%
	385	-	4.9%	-	-	-	-	94.7%	0.4%	-	100.0%
	390	-	-	-	-	-	-	100.0%	-	-	100.0%
	625	-	51.3%	-	-	-	-	38.5%	10.3%	-	100.0%
	952	0.2%	86.5%	-	-	13.1%	-	-	0.2%	-	100.0%
Total Potential Industries		3.9%	32.4%	0.0%	1.3%	0.1%	1.8%	53.8%	0.3%	6.5%	100.0%
Less Potential Industries	311	0.2%	11.7%	-	-	0.0%	3.6%	83.3%	-	1.3%	100.0%
	313	-	8.6%	-	-	6.4%	-	84.4%	0.4%	0.2%	100.0%
	322	-	35.4%	-	-	7.2%	-	57.4%	-	-	100.0%
	324	-	-	-	-	-	43.4%	-	-	56.6%	100.0%
	3691 - 3696	-	-	64.8%	-	-	-	-	35.2%	-	100.0%
	410	-	-	-	-	-	-	100.0%	-	-	100.0%
Total Less Potential Industries		0.0%	8.7%	7.2%	-	4.1%	1.1%	73.9%	4.2%	0.8%	100.0%
Grand Total		2.9%	22.6%	2.9%	0.8%	4.4%	3.3%	56.2%	3.7%	3.2%	100.0%

Note:
1. Transport and final disposal at municipal landfill by own means of transprtation.
2. Transport and final disposal at municipal landfill by consignment of private contractor.
3. Final disposal at factory's compound and/or its property land.
4. Long-time storage at factory's compound awaiting external treatment/disposal.
5. Discharge to sewer or watercourse
6. Disposal consigned to private contractor - treatment and disposal is not known.
7. Reutilization by other parties, e.g. use at other factory as raw material.
8. Others.

g. Hazardous substances

It is only a few among the 199 factories that identified and reported hazardous substances; i.e. the number of factories identified Pb, Cr, As, organic phosphorous compounds and solvents/pigments are; 2 (non-ferrous metal), 4 (ferrous, tannery and electric parts), 1 (metal plating), 1 (electric parts) and 10 (others).

i. Hazardous Waste Management

ia. General

Entrepreneurs in general consider that in the productive process HW are not generated. This statement is almost constant and to obtain the required data, the questionnaire was oriented towards the management of HW, as well as inputs, and raw materials. In this way, all hazardous materials like fuels, solvents, acids, etc., were taken into consideration.

The responses were in a framework such that, the raw materials or hazardous components that are used were always in small quantities and in low concentrations, which do not imply a risk associated to the management and manipulation of HW and materials.

Therefore, it presents a high percentage of positive answers to the current management system of materials and wastes, that is to say, the current existence of people responsible for management and control, the existence of established procedures for management and storage.

ib. Current HWM

In relation to the current system for management of hazardous materials and wastes, 80% of the surveyed industry samples have people responsible for the management and control of hazardous materials and wastes, which are clearly defined, marked and stored separately. 74% of the industry samples have no treatment for hazardous wastes. The majority of the remaining 18% have filters for the control of gases.

The problems that are presented for the management of HW are:

- Lack of knowledge and information to identify what is hazardous waste, which corresponds to 49% of the sample factories.
- 45% currently expresses having problems with the lack of regulations

and norms that define what is to be done.

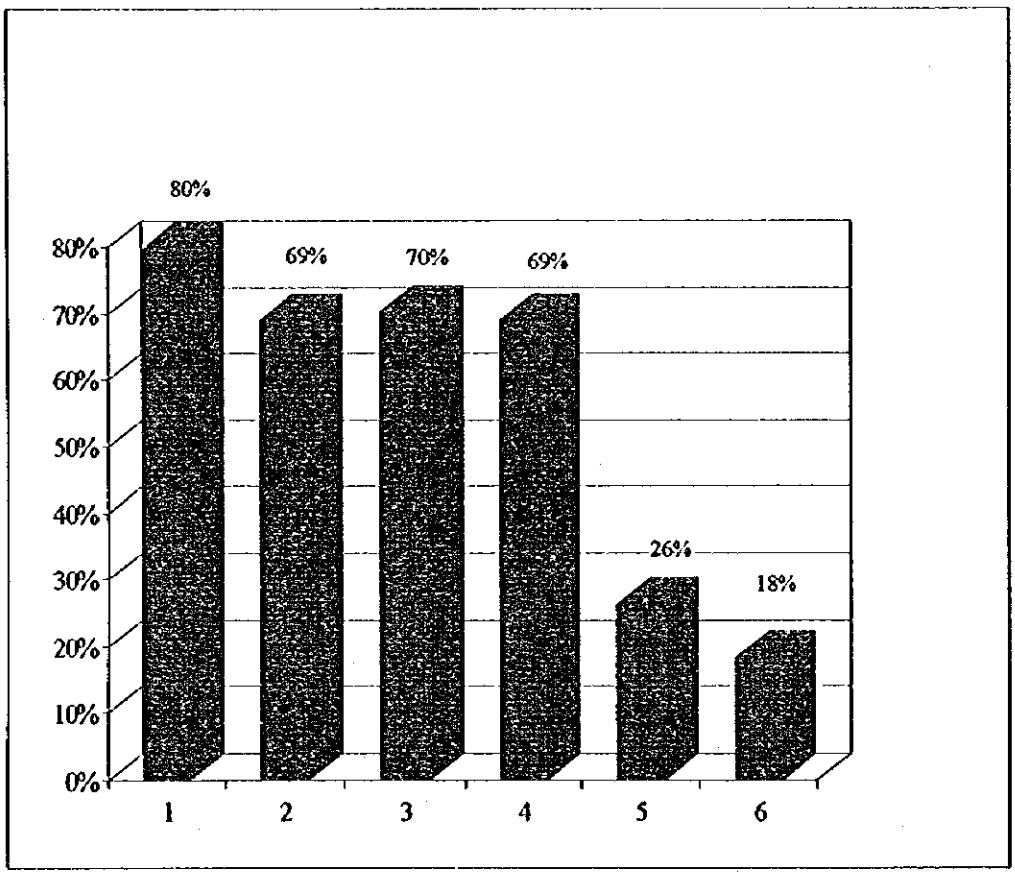
- A smaller percentage, 37% of the respondents claims to not have information about technologies for adequate storage and disposal of hazardous waste.

The entrepreneur's opinion regarding the current system of hazardous waste management in the "MR", is that the system needs to be gradually improved to apply higher standards (55%) and that urgent improvements are needed (49%).

Q6. Present Management of Hazardous Waste

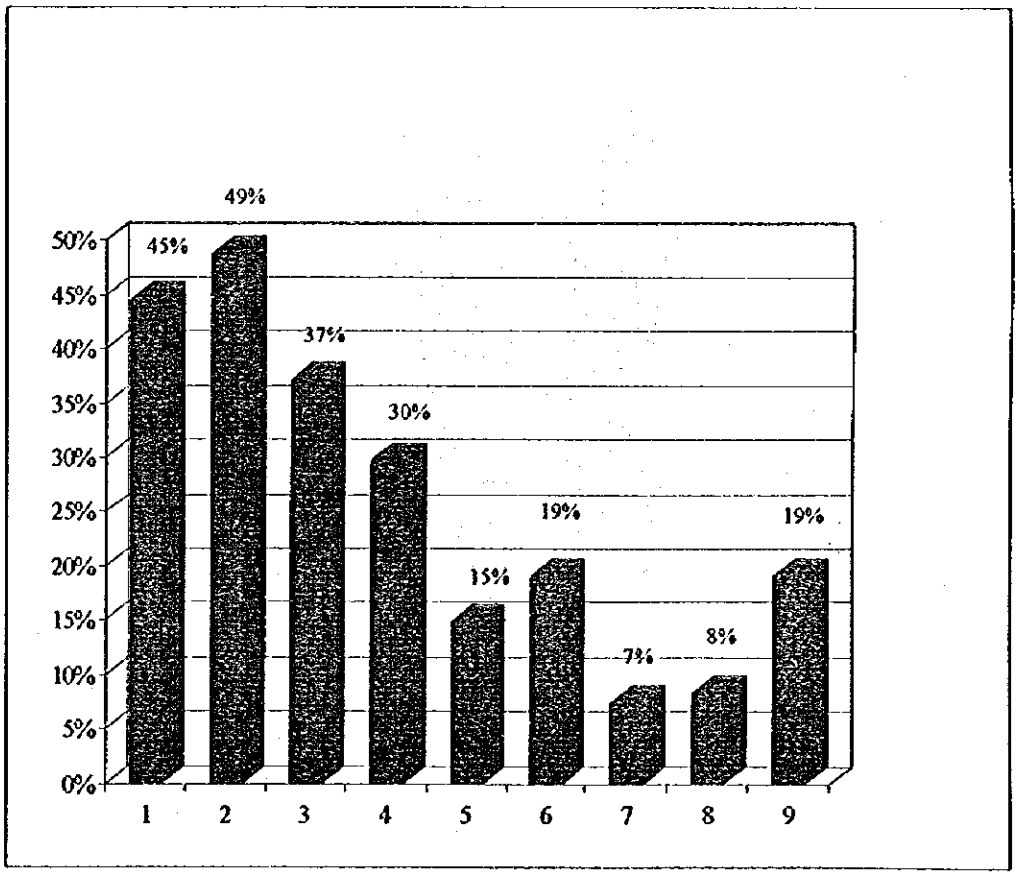
Q6.1 Describe the present management system for hazardous materials and wastes in your factory (Plural answers are acceptable):

1. There are appointed responsible persons for management and control of hazardous materials and waste.
2. There are implemented safety procedures for hazardous materials and waste.
3. Hazardous waste and materials are clearly defined and marked.
4. Hazardous materials and wastes are separately stored.
5. There are treatment facilities for hazardous wastes in the factory. (Please describe the type of them
6. Others. (Please specify)



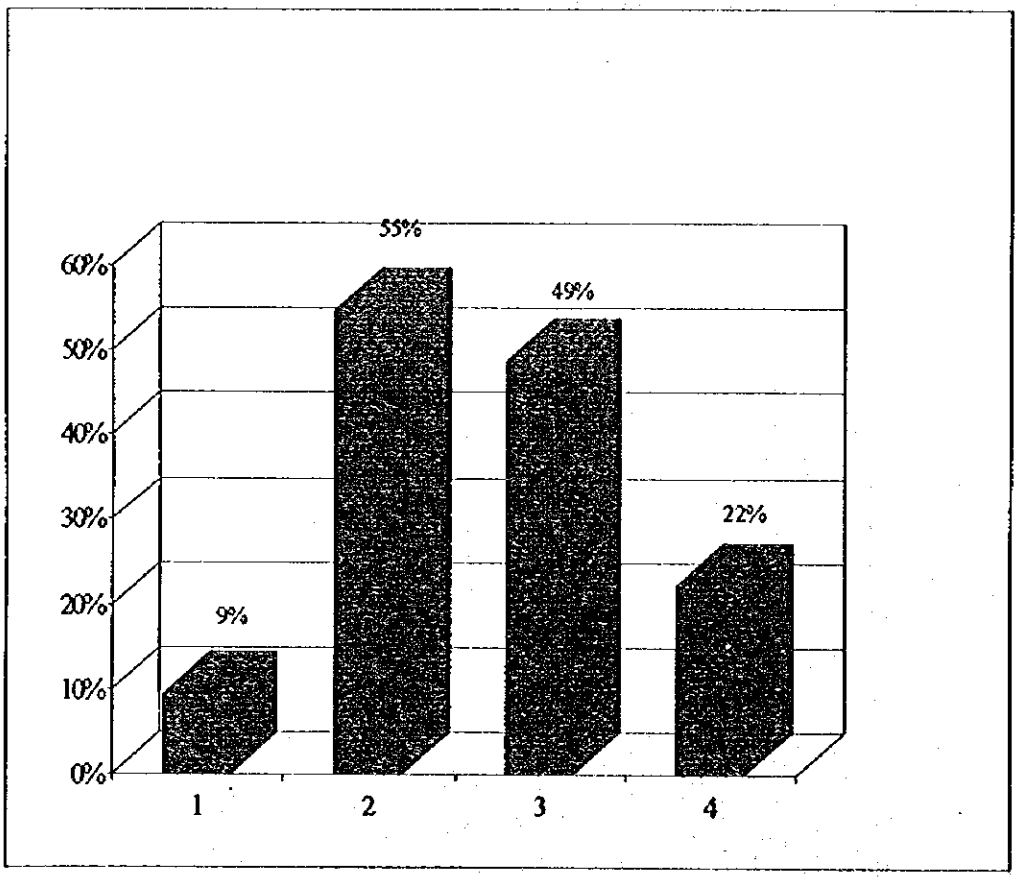
Q6.2 Specify the present problems regarding hazardous waste management in your factory (plural answers are acceptable):

1. Lack of regulations and guidelines defining what to do.
2. Lack of information by which we can identify what is hazardous waste.
3. Lack of information on technology for proper storage and disposal of hazardous waste.
4. There are no treatment and disposal facilities of hazardous waste available.
5. The amount of hazardous waste stored at the factory increases.
6. Treatment of hazardous waste is expensive.
7. Financial limitation for hazardous waste treatment.
8. Lack of laboratories for the identification of hazardous materials.
9. Others (Please specify)



Q6.3 What is your opinion regarding the hazardous waste management system in the Metropolitan Region?

1. There are no specific problems in the present management system.
2. The present management system needs gradual improvement to apply higher standards.
3. An urgent improvement is necessary.
4. Others (Please specify)



ic. Future HWM

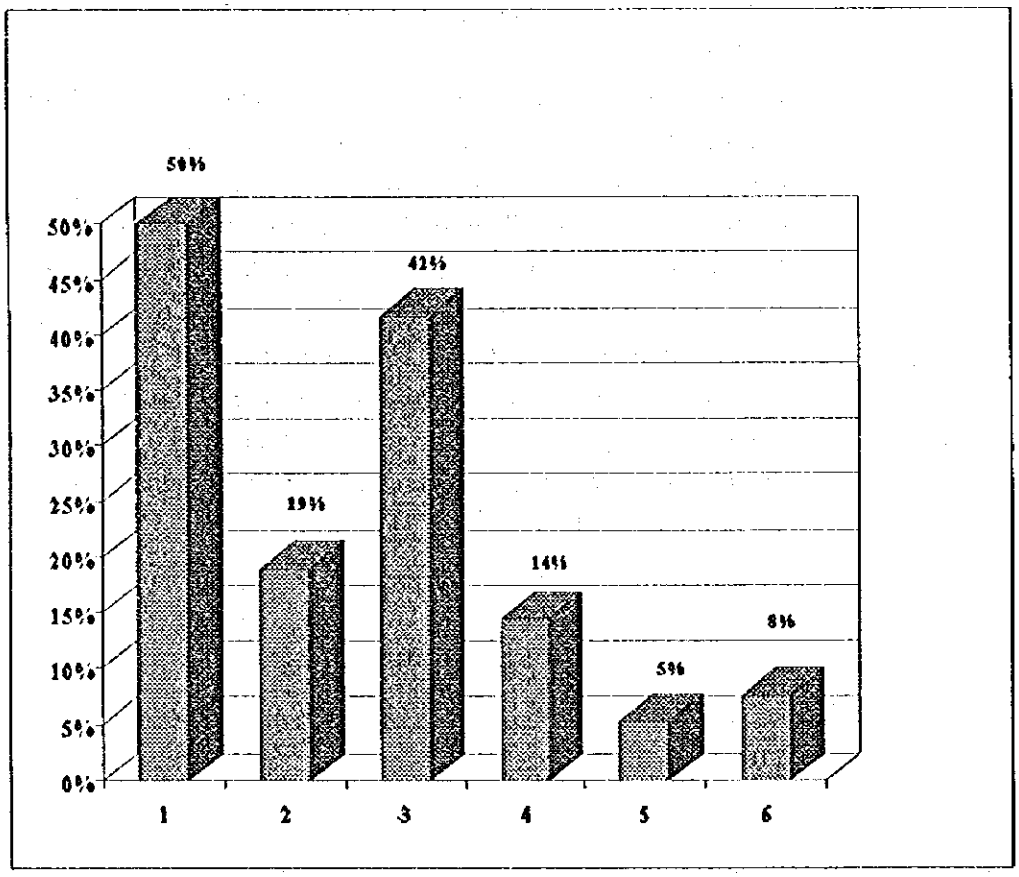
The future tendency regarding HW and intention of factories on management of HW are that:

- The 50% of the respondents believe that the generation of hazardous wastes will not increase greatly. In addition, 42% responded that there will be a decrease of HW due to improvement of manufacturing process and change of raw materials.
- 53% of factories intend to improve their on-site HWM system in accordance with the reinforcement of environmental regulations, while 41% wish to ameliorate the HWM system independently.
- Concerning future reduction and recycling of wastes in the industries, 47% of the sample said they would not alter their current management and 49% of factories intend to improve the present system.
- 51% of the respondents have the intention of improving the present system of treatment and final disposal of ISW while 46% will basically apply the present system.
- In the case of the necessity to treat hazardous wastes, 53% of the sample will consign waste to other companies, considering it a lower cost than if the treatment is carried out inside the factory. On the contrary, only 25% will install their own treatment facilities.
- In relation to the cost of disposal of hazardous wastes, 32% of the sample consider that costs will not be significant and their increase will not be important and 29% answered an improved ISWM is necessary to obtain an "environmentally friendly" image of products - regardless of costs. However, an equal proportion of factories consider that the disposal costs are significant and considerably higher costs would affect the price of products (30%).

Q7. Future Management of Hazardous Waste

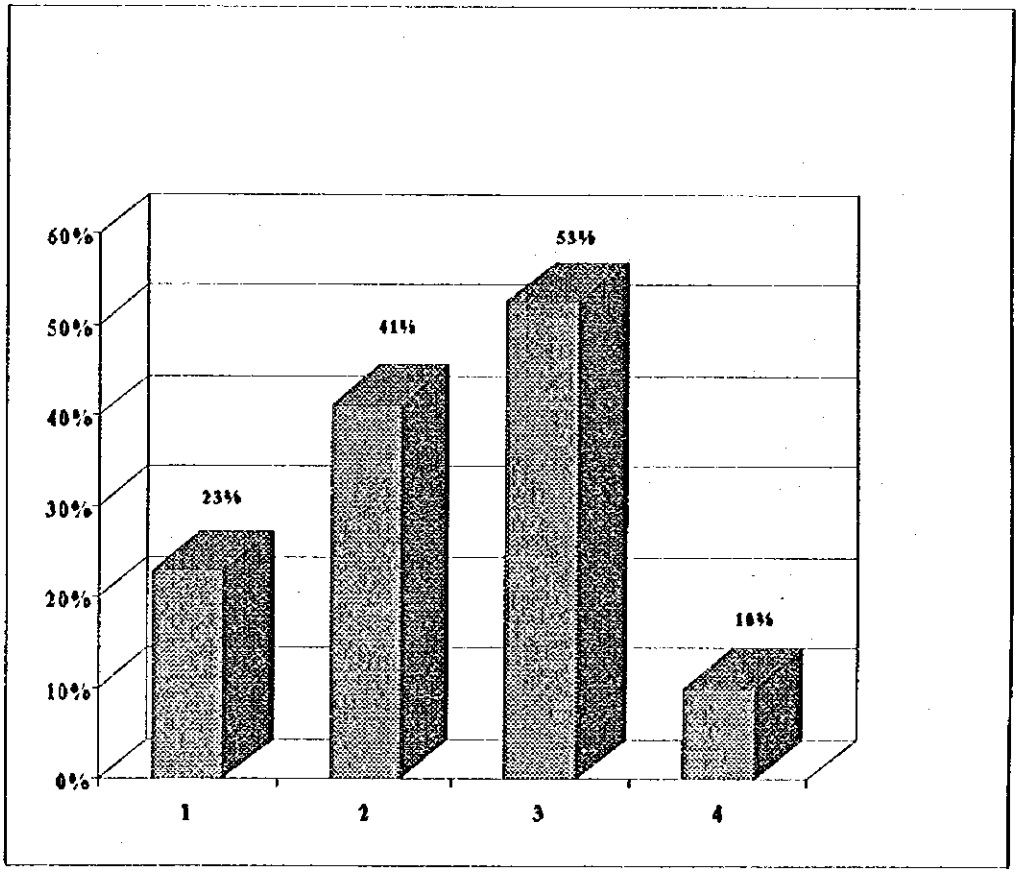
Q7.1 How will the generation of hazardous waste develop in your factory (plural answers are acceptable if 4 or 5 is included)?

1. It (hazardous waste) will not increase so much.
2. It will increase due to expansion of production, change of raw materials, etc..
3. It will decrease due to improvement of manufacturing process and change of raw materials, etc..
4. Hazardous sludge, solvents, acids, alkalis, etc., will increase due to the reinforcement of water quality regulation for discharging.
5. Hazardous dust will increase due to the reinforcement of flue gas regulation.
6. Others (please specify)



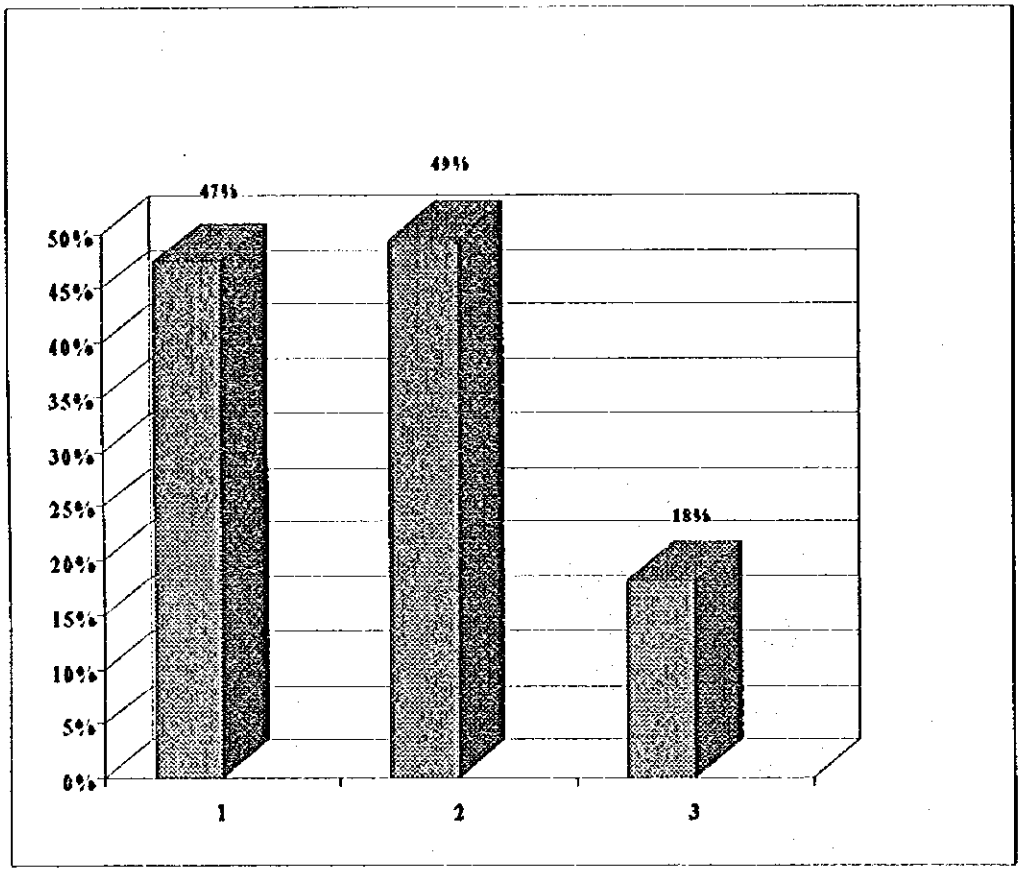
Q7.2 What is your intention concerning the future general hazardous wastes management system in your factory?

1. Basically, we will apply the present system.
2. We intend to improve the present system of our company independently of possible environmental regulation.
3. We will improve our system in accordance with the reinforcement of environmental regulation.
4. Others (Please specify)



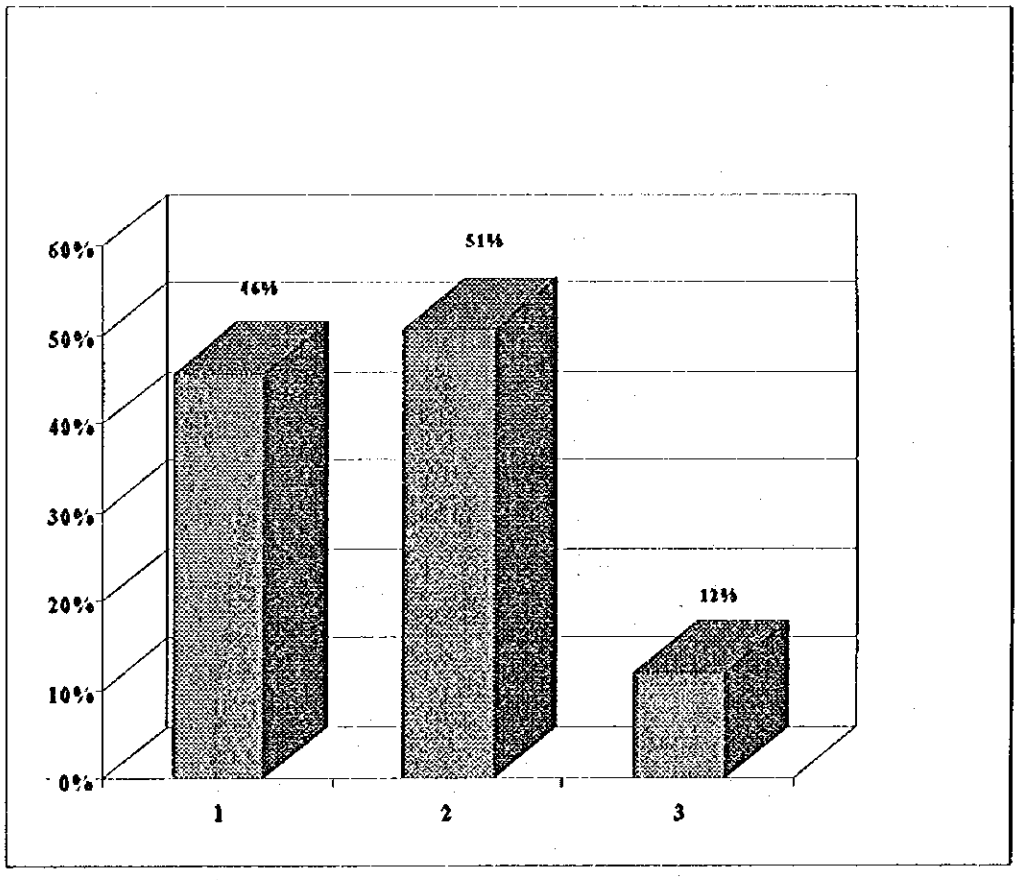
Q7.3 What is your intention concerning future reduction and recycling of wastes in your factory?

1. Basically, we will apply the present management.
2. We intend to improve the present waste reduction and recycling system. (Please specify the intentions)
3. We have a specific plan to improve waste reduction and recycling system in our factory. (Please specify the plan)



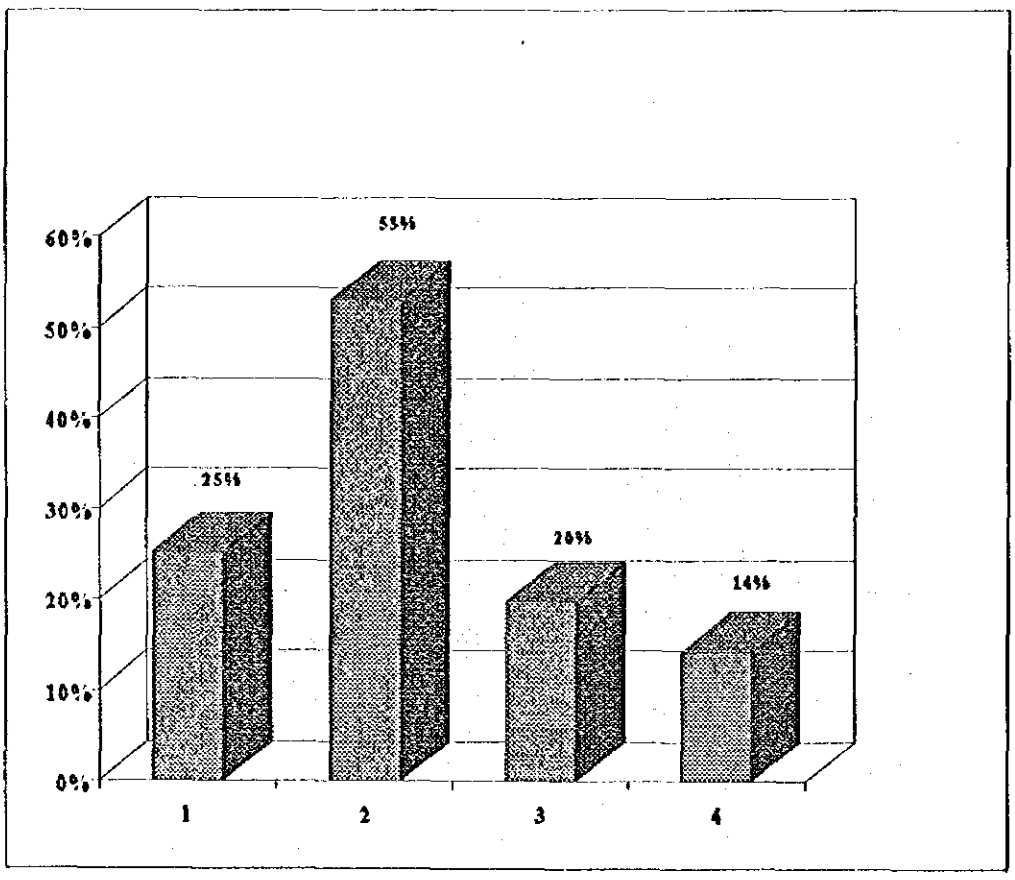
Q7.4 What is your intention concerning <u>treatment and final disposal</u> of wastes in your factory?

1. Basically, we will apply the present management.
2. We intend to improve present treatment and disposal system of our company. (Please specify the intentions)
3. We have a specific plan to improve treatment and disposal system in our factory. (Please specify the plan)



Q7.5 In case you need to treat hazardous wastes, how do you respond to the needs?

1. We will install our own treatment facility.
2. We will consign to other company, if this is cheaper than we can do it ourselves.
3. We will consign to other companies, even if this is slightly more expensive than the cost of own treatment facilities.
4. Others (Please specify)



Q7.6 How will probable higher costs of hazardous waste disposal affect your factory?

1. The present costs of waste disposal are not significant and increased costs will not be important.
2. The present costs of waste disposal are significant and considerable higher costs will affect the price of our products.
3. The present costs of waste disposal are very significant and considerable higher costs will affect the existence of our factory.
4. An improved waste management is necessary to obtain environmental image of products - no matter the costs.
5. Other (Please specify)