

3.2 Site 2 in the East Part of Bangkok

It is estimated that Case 1 will require 271 Baht per ton of waste to be disposed, about 21 % higher than Case 2 which requires 224 Baht/ton. The major cost difference arises from the difference in the leachate treatment systems between the two cases.

Table A5-5 shows costs estimated for both cases.

Table A5-5 Costs of Sanitary Landfill for Cases 1 and 2 Planned in the East Part of Bangkok

	CASE 1		CASE 2	
	TOTAL (Million Baht)	UNIT COST (Baht/ton)	TOTAL (Million Baht)	UNIT COST (Baht/ton)
1. Civil Work	1,058	97	732	67
2. Leachate Treatment Facility	120	11	260	24
3. Sub-Total (1 + 2)	1,178	108	992	91
4. Land Purchase	952	87	952	87
5. Total (3 + 4)	2,130	195	1,944	178
6. Operation/Maintenance	836	76	506	46
7. Grand Total	2,966	271	2,450	224
Total Waste Disposal Amount	11,000,000 tons		11,000,000 tons	

**Appendix 6. Comments on the 1982 JICA Study on Bangkok Solid
Waste Management**

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1. Contribution by the 1982 Study

A vigorous study on Bangkok's solid waste management was carried by the previous JICA Study Team from 1979 till 1982. The Study produced a master plan on Bangkok's solid waste management with many recommendations.

The following recommendations have already been put into practice by the BMA:

- a. To weigh collection amounts and record them.
- b. To establish a technical division.
- c. To use special waste bags to store hospital waste at waste depots in the hospitals.
- d. To collect waste from houses located along Khlongs by using boats.
- e. To provide collection workers with uniform.

The 1982 Study contributed to the improvement of Bangkok's solid waste management also by collecting and compiling basic data such as per-capita waste generation rates, waste collection efficiency and waste composition, etc.

2. Treatment and Disposal Plan Prepared by the 1982 Study

The 1982 Study proposed increases of composting capacity, and introduction of incinerators and landfill as a major treatment and disposal plan. Disposal amounts by respective systems in 2000 were proposed as shown below:

Disposal Plan by 1982 JICA Study

Proposed Disposal Systems	Proposed Disposal Amounts (ton/day) in year 2000
1. Composting	1,630 (30%)
2. Incineration	2,400 (43%)
3. Landfill	1,510 (27%)
Total	5,540 (100%)

Note: 1. Design capacity of composting plants and incinerators are 1,920 ton/day and 3,000 ton/day respectively.

2. It was assumed that an incinerator, proposed at Yannawa would start its operation in 1990, while the other incinerator at Dusit would start its operation in 1995.

The reality of Bangkok's solid waste management however turned out to be very different from the master plan proposed by the previous Study, i.e. the DPC's compost plants have not virtually performed their functions, incinerators were not constructed. Reasons for the disposal and treatment plan having not been implemented include the following:

- 1) The compost business has not been cost-effective at all though the increase of the DPC's composting plant capacity was the BMA's policy, which the previous study team followed.
- 2) The proposed incineration plan turned out to be infeasible due to the following reasons:
 - a. The previous study team was not informed of a land utilization plan for Yannawa, the team's proposed incineration site.
 - b. Costs of incineration turned out to be much higher than those estimated by the 1982 Study as shown below:

ITEMS	Unit: Million Baht	
	COST OF INCINERATOR (1,000 tons/day) ESTIMATED BY 1982 STUDY	COST OF INCINERATOR (600 tons/day) ESTIMATED BY THE CURRENT STUDY
- Construction	1,190	1,714
- Land purchase	176	0
- Operation/Maintenance	523 for 20 years	1,965 for 15 years
- Allowance for tax	0	128
Total	1,889	3,807

A total cost 1,889 million Baht estimated by the 1982 Study may be recalculated at about 2,585 million Baht in 1990 price assuming annual inflation was 4 % on average. The recalculated cost of an incineration (1,000 tons/day) however is still lower than the cost of an incinerator (600 tons/day) estimated by the current study.

It seems that there are two major reasons explaining the higher current cost of the incinerator as shown below:

- i. The value of the Thai currency Baht substantially dropped against other foreign currencies during the past years.
- ii. The operation/maintenance cost estimated by the 1982 Study was too low.

- 3) Actual waste collection amounts turned out to be much larger than those estimated by the 1982 Study. Actual waste amount collected during the period 1982-1989 was 3,416 ton/day on average, 32 % higher than the corresponding amount (2,520 ton/day) estimated by the 1982 Study. The unexpectedly rapid increase of waste may be attributable to mainly a higher priority given to the waste collection by the present administration.
- 4) The 1982 Study assumed that 20 % of the investment costs for incinerators, new compost plants and rehabilitation of the existing compost plants would be funded by the subsidy given by the central government. No subsidy however was so far available.

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