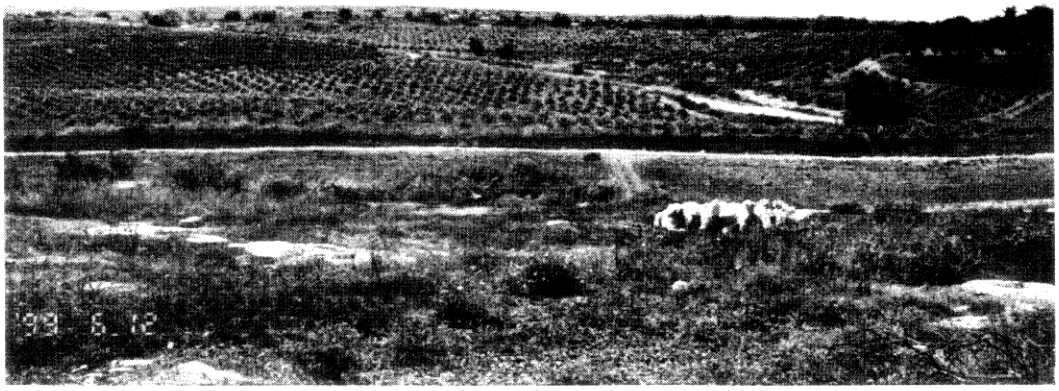
(1) View from Tekke Village
Green buffer zone is partially seen beyond the entrace.



(2) View from Burhan Village
No change in view

Figure 14-48: View of this Project site in 2005

14.5.3.9 Air Pollution

Pollution caused by exhaust gases, dust, smoke, etc. from waste collection vehicles and the disposal site.

a. Construction

a.1 Negative Impact

Construction activities will involve small number of earthmoving machines, dump trucks, rollers and a few light vehicles at the site, and transportation vehicles of materials and equipment for construction.

The main sources of air pollution will be dust generated from the construction activities and exhaust gases from construction vehicles at the site. Significant quantities of dust may be produced during the dry season but the regular use of water sprays should minimise dust production.

The effect of exhaust gases from construction vehicles will have a low negative impact as they will mainly affect construction workers and hence appropriate equipment should be worn (e.g., face masks). As very few houses are located within 1,000m from the site and the prevailing winds will disperse airborne pollutants away to the area in NE or SW during dry season, in the direction of which there is no residential settlement within a several kilo-meters, no adverse impacts are expected to occur beyond the site boundary.

a.2 Positive Impact

Positive impact is not expected.

b. Operation

b.1 Negative Impact

Generally, it is expected that operation of the final disposal site will have a low negative impact on air quality. No significant adverse impacts will occur beyond the site boundary due to a buffer zone of 30 m maintained around the site, very few houses being located within 1,000m radius of the site and the prevailing winds dispersing pollutants away in the direction of the area where there is no residential settlement within a several kilo-meters.

b.1.1 Landfill Gas

The biological decomposition processes in a disposal site with municipal solid waste result in the generation of landfill gas. Under normal conditions, landfill gas production rates reach a peak within the first 2 years and then slowly taper off, continuing many cases for periods of up 25 years or more. In most cases, over 90% of the gas volume produced is methane and carbon dioxide. If vented to the atmosphere in an uncontrolled manner, methane can accumulate in the enclosed spaces. When methane concentrations in the air are between 5-15%, it is explosive.

Carbon dioxide, being heavier than air, tends to migrate downwards, often leading to high concentrations of carbon dioxide in the lower part of a disposal site for many years. Ultimately, it can move downwards through the underlying strata, until it reaches the groundwater, where it will usually lower the pH.

The disposal site will be furnished with installations for controlled ventilation of landfill gas to the atmosphere with gas being collected and vented from the top of the disposal site and subsequently dispersed by the wind. Under these conditions neither methane nor carbon dioxide should detrimentally affect air quality near the site.

b.1.2 Dust

Significant quantities of dust may be generated during the dry season due to landfill equipment and waste collection vehicles movements but this can be controlled through the use of water sprays. The impact should be minimal.

b.1.3 Landfill Vehicle

The impact of vehicle fumes on air pollution is considered negligible due to the relatively small number of vehicles operating within the disposal site at one time. The equipment for the sanitary landfill consists of two bulldozers, two dump trucks, one wheel loader, one backhoe and a water tank truck. Regular maintenance of vehicles will help to minimise this problem.

b.1.4 Landfill Fire

The waste disposal will be operated with a relatively small tipping front, and the waste will be compacted and daily soil cover will be applied. These practices will help to minimise the possibility of any spontaneous fires breaking out, which can produce large quantities of smoke and environmentally harmful gases, including dioxins. Any fires which break out must be extinguished immediately.

b.1.5 Waste Collection Vehicle

The amounts of municipal waste at Mersin in 1998 and 2005 are shown in Table 14-33. In this project , intermediate treatment like a sorting plant and a compost plant will be introduced, and those plants will be located next to the disposal site. Therefore, both of compostable waste and non-compostable waste will be transported to the proposed site through the same access road. The number of the collection vehicles which came to the existing disposal site in 1998 is shown in Table 14-34. The average number of collection vehicles is 62.5vehicles/day from Monday to Saturday. The datum of Sunday was omitted because it is unusual. Since the amount of waste hauled into the existing site is 423t, on assumption of specific gravity of 0.3t/ m^3, the average capacity of collection vehicle can be calculated:

423 / 0.3 / 62.5 23 m^3/vehicles.

Using this value, the number of collection vehicles can be predicted in 2005:

659 / 0.3 / 23 96 vehicles / day

The air pollution caused by vehicles is promoted according to the increase of number of vehicles. On the result of air pollution survey conducted in May and June, 1999, near the access road to Cimsa proposed site, the concentrations of SO_2 and NO_x are:

SO_2 : 17.4 μ g/ m^3
NO_x : 102.9 μ g/ m^3

The concentration of NO_x is very high because the large trucks pass the access road to transport the raw material for cement or glass company. The number of the large

vehicles (truck and minibus) was 363 vehicles/day. Therefore, in 2005 the concentration of air pollution will be:

SO_2 : 17.4 + (17.4 x 96/ 363) = 22.0 μ g/m^3	< 150 μ g/ m^3
NO_x : 102.9 + (102.9 x 96 / 363) = 130.1 μ g/m^3	200 μ g/ m^3(NO)
	100 μ g/m^3(NO_2)

The concentrations of SO_2 will not exceed Long Term Standards(on right side) from The Air Quality Protection Regulation. As the proportion of NO to NO_2 was not analysed, on the assumption that the proportion of NO is 35% because the sampling point was near the road, the standard of NO_x would be 135 μ g/m^3 (=200 x 0.35+100 x 0.65) and the concentration in 2005 would be below the standard. Moreover, there is no houses along the access road from the junction point of the road to Tekke village. Therefore, the impact by waste collection vehicles will be negligible.

However, on the road in front of the cement company, it is estimated that the concentration of NO_x has already exceeded the standard because the traffic volume of large vehicles are three times more than on the access road. The improvement will be necessary.

Table 14-33: The Amount of Waste in Mersin

unit: t/day

YEAR	1998	2005
Generated Waste	446	663
Discharged Waste	425	644
Collected Waste	407	637
Waste to Mersin Site	423	659

Table 14-34: The Number of Collection Vehicles to Existing Disposal Site in Mersin(1999)

unit: vehicles /day

Mon.	Tue.	Wed.	Thu.	Fri.	Sat.	Sun.
69	65	63	65	63	50	38

b.2 Positive Impact

Positive impact is not expected.

c. Aftercare

c.1 Negative Impact

As discussed above, landfill gases will continue to be produced in gradually diminishing volumes for periods of up to 25 years or more. On closure, the landfill gas ventilation facilities will remain in place and should be regularly inspected and maintained until it is determined that landfill gas emissions are negligible and no longer pose a safety threat.

Since the disposal site will be capped, grassed and planted, no adverse impact on air quality from dust or fires is expected during the aftercare stages.

c.2 Positive Impact

Positive impact is not expected.

14.5.3.10 Water Pollution

Pollution caused by inflow of soil, leachate and runoff from the disposal site into rivers and groundwater

a. Construction

a.1 Negative Impact

The major construction activities will take place within one watershed, in which all surface water runoff is trapped. The suspended soil in the surface water discharged from the earthworks site will be settled through a sedimentation pond constructed downstream during the rainy season.

During the construction stage, earthworks may have a minor effect on infiltration flows and there will be no negative impact on groundwater quality.

a.2 Positive Impact

Positive impact is not expected.

b. Operation

b.1 Negative Impact

b.1.1 Final Disposal Site

The disposal site will be divided into three phases and the area in every phase will be separated into two sections by embankment. One section is capable for disposal of one year. The leachate from first section of phase 1 will be collected in the stabilisation pond and discharged outside after treatment. It will not be circulated because there is not enough waste in the first section and the effectiveness of circulation cannot be expected. The concentration of leachate is to be reduced below the value of standards of regulation before discharging. Therefore, there will be little impact on the water quality in the downstream area.

As the leachate from the second section will be circulated into the first section and not discharged outside, there will be no impact on the water quality in the surrounding area.

After the operation of phase 1 terminates and the area is capped with a final 1m thick layer of soil, it is assumed that 30% of rainwater on the site would infiltrate into the waste and 70% would go out of the area. Therefore, the volume of leachate to be treated will diminish with time.

b.1.2 Medical Waste Disposal Site

In medical waste disposal site the perfect closed system will be introduced regarding waste water treatment. The impermeable sheet is to be equipped to prevent the

leachate infiltrating into the ground in accordance with the Regulation on Control of Medical Wastes. The site is divided into more than ten sections with embankments and the operation is conducted in one section. All rainwater on the section in operation shall not be discharged outside because the leachate may be significantly polluted with infectious and hazardous waste, while rainwater on the other sections will be discharged to the outside. The leachate is collected in the regulation pond and circulated to the site in operation. It is expected that during the circulation the pollutants in the leachate will be reduced gradually while the volume of leachate will be also reduced by evaporation.

b.1.3 Sorting Plant

Four types of water will be drained from the sorting plant, i.e., domestic wastewater from the control room, leachate from waste, wastewater from the sorting plant cleansing and surface water from rain.

Domestic water is to be treated in a septic tank and discharged to the leachate treatment pond situated downstream of disposal site. Leachate from waste and wastewater from plant cleansing are treated by rapid filtration equipped in the plant and discharged to the leachate treatment facility. Wastewater in the treatment facility will be discharged out of the site after treatment for the first year, and from the second year it will be collected in the regulation pond and circulated to the disposal site to reduce the concentration of pollutant. Rainwater is drained to the outside of the plant without treatment by a drain system independent of the other wastewater.

Therefore, the impact to the surface water and groundwater due to wastewater from the sorting plant will be negligible.

b.1.4 Compost Plant

There are four processes in the compost plant, which discharge the wastewater, i.e., pre-treatment section, composting area, maturation area and screening area.

In pre-treatment section, domestic wastewater is treated by simplified septic tank and discharged to the leachate treatment facility for final disposal site for the first year. The leachate from the waste and wastewater from cleansing of the section is treated by rapid filtration and discharged also to the leachate treatment facility for the first year. From the second year, the above-mentioned polluted water is circulated in the same way as the case of the sorting plant. Rainwater is drained to the outside of the plant without treatment by a drain system independent of the other wastewater.

In composting area, a screen is used to remove suspended solids from leachate released from the piles in the early stage, surplus from sprayed water for moisture control, and wastewater from cleansing of the area. These are consequently discharged to the leachate treatment facility for the disposal site

In maturation area, wastewater from floor cleansing and rainwater in this area will be treated together with wastewater from the composting area.
In screening area, wastewater generated in this area is also treated with wastewater from the composting area and maturation area.

Therefore, the impact due to the wastewater from the compost plant will be negligible.

b.2 Positive Impact

Positive impact is not expected.

c. Aftercare

c.1 Negative Impact

Leachate will continue to be produced after the termination of operation in the disposal site. Although production rate of leachate will diminish with time, it should be inspected regularly according to the monitoring plan.

The leachate is to be inspected for 10 years at the medical waste disposal site.

Therefore, negative impact on surface water and groundwater is expected to be minimal.

c.2 Positive Impact

Positive impact is not expected.

14.5.3.11 Soil Contamination

Contamination of soil by leakage of fuel, diffusion of ash and leachate, etc. from the disposal site.

a. Construction

a.1 Negative Impact

During this stage, soil contamination may occur due to possible spillage of oil from construction equipment and vehicles and leakage of fuel. However, the contamination will be negligible because of the small numbers of construction equipment and vehicles.

a.2 Positive Impact

Positive Impact is not expected.

b. Operation

b.1 Negative Impact

Soil contamination by substances present in the leachate from the deposited waste will occur. However, contamination will be minor as over 86.0%(at year 2005) of the municipal waste will be organic in nature, and hazardous and toxic waste is prohibited. The infectious and medical waste is disposed of at the specially prepared site. Hence, during the operation stage, the extent of contamination of the soil caused by the deposed waste is expected to be negligible.

The soil contamination due to infectious and medical waste can be avoided since the medical waste disposal site is to be installed with the liner to prevent the leachate permeating through the bottom of the site. However, as the medical waste is to be covered with soil every day, medical waste and soil will be accumulated in layers. Thus, the monitoring is to be carried out regularly. The medical waste and cover soil will not be taken out from the site because it will be strictly controlled. According to the monitoring plan of this project, the leachate from regulation pond and the water

from the monitoring well will be analysed once in rainy season and dry season respectively. When the unusual pollution is found, the manager can improve effectively the medical waste disposal and make the impact minimal.

The diffusion of ash from the disposal site can be prevented by daily covering waste with soil. Spillage of oil from operational equipment and vehicles and the spillage of fuel may occur, but the impact on soil contamination is likely to be negligible.

b.2 Positive Impact

Positive Impact is not expected.

c. Aftercare

c.1 Negative Impact

During this stage, soil contamination is not likely to be aggravated. The leachate production is significantly reduced because most of the rain water runs down on the sloped surface of cover soil to the drain without penetrating into the accumulated waste.

After the termination of operation, the site may be planted and used for a green park or some recreational area for citizens. The impact on the surrounding area by contaminated soil will not occur since the soil within the site will not be carried out of the site.

As for medical waste, the sustainable monitoring system is indispensable so that the contaminated soil can not be taken out of the site and so that the leachate can not flow away to the outside to contaminate the soil in the surrounding area. According to the monitoring plan the leachate is to be inspected regularly for 10 years. Therefore, the impact on the soil in the surrounding area is expected to be minimal.

c.2 Positive Impact

Positive impact is not expected.

14.5.3.12 Noise and Vibration

14.5.3.12.1 Noise

Noise and vibration generated by construction equipment, landfill site equipment and waste collection vehicles

a. Construction

a.1 Negative Impact

There are many kinds of construction works in this project, like planting of green trees in buffer zone, earthworks for disposal site, building of a sorting plant and a compost plant, construction of medical waste disposal site and treatment ponds for leachate. Factors of construction which generate noise are as follows;

1. Construction of green belt
   Trucks for transportation of trees and heavy machines to dig holes for planting
2. Construction of a sorting plant and a compost plant

Trucks for transportation of materials and equipment to build the plants

3. Construction of final disposal site for municipal waste and medical waste
   Heavy machines for earthworks
4. Construction of ponds for leachate
   Heavy machines for earthworks

Some degree of noise and vibration will be generated in every construction. However, the impact of noise will be negligible because there are very few houses within 1,000 m outside from the boundary of the disposal site. Moreover, it is expected that there will be little probability of new houses to be built around the site because the duration of the construction will be relatively short (1 year).

As for the noise from vehicles on the environment along the road, it is negligible because the frequency of transportation of construction material and equipment will be much less than that of general traffic.

a.2 Positive Impact

Positive impact is not expected.

b. Operation

b.1 Negative Impact

b.1.1 At the Landfill Site

The recommended permanent equipment for the sanitary landfill consists of two bulldozers, three dump trucks, one excavator and a water tank truck. Maximum noise levels will be produced when bulldozers are operating simultaneously.

Maximum noise levels can be calculated on the data of noise level 110dB in Table 14-35, using the following equation:

$$P = 10\log_{10} \; 10^{Pi/10}$$

Where : P = resulting noise level (dB) from a number of sources
Pi = noise level from each source

This gives maximum noise levels of 113dB at the source.

Table 14-35: Power Noise Level of Heavy Machine

No.	Machine for operation	Noise level (power level: dB)	Unit
1	Bulldozer	110	2
2	Dump Truck	100	3
3	Excavator	100	1
4	Water tank truck	80	1

Presently, there are very few houses within 1,000m outside from the boundary of the proposed site. Noise is generally reduced in accordance with the increase of distance from the noise source. In reality, as the noise is reduced with the equation 20log **r** (**r** = distance from the source), in case that the distance is 1,000m, 60dB is expected to be reduced ($20\log_{10}1{,}000 = 60$) and 113dB becomes 53 dB at the receiving point. The

noise from other heavy machine is also reduced to about 40 dB. Therefore, the impact of noise during operation is negligible.

b.1.2 Sorting Plant and Compost Plant

At sorting plant, major noise sources are wheel loader at reception hall, metals dropped from the magnetic separator and truck for transportation of residue. The noises from feeding conveyor, plastic bag breaker, hand-sorting conveyor, residue conveyor and press machines are negligible because those noises are low.

Since the wheel loader is operated to haul the waste to the feed-hopper and stops the operation when the feed-hopper is full, it does not always produce the noise. Although the power level of noise is at most approximately 110 dB(A), some amount of noise is reduced by the penetration loss of building wall because the waste reception is located in the enclosed building. Furthermore, there are very few houses within 1,000 m from the site of sorting plant. It is expected to be at least 60dB(A) decrease of noise in accordance with the distance between the noise source and receiver.

The noise is produced when the metals like cans caught by the magnetic separator are subsequently dropped into the bucket. However, it will be reduced because the rubber sheet is to be equipped on the surface of the bucket to avoid the noise generation.

The truck for transportation of residue stops the engine and parks below the residue conveyor until it is filled with residue. As the amount of residue produced at sorting plant in 2005 will be 99 t/day and the operation time is 14 hours, the residue amount per hour will be 7 ton /hour (99 / 14 = 7). This amount can be transported by the truck only a few times per hour. Therefore, the impact by noise of the truck is negligible.

At compost plant, major noise sources are wheel loader at reception area and selective crushing separator. The wheel loader is expected to be the same situation as the case of sorting plant.

The selective crushing separator will produce high noise because it crushes the waste. The noise level will be 80 dB(A) at most. However, there are very few houses within 1,000 m from the site of compost plant and it is expected that the reduction of noise will be more than 60dB(A) (20log 1000 = 60) at the surrounding residential areas.

Therefore, the impact by noise generated from the compost plant is negligible on the daily life at surrounding area.

b.1.3 Waste Collection Vehicles

The number of collection vehicles (96/day) can be calculated in “15.5.3.9 Air Pollution” for 2005, and the trucks which transport the waste to the Cimsa site concentrate during 3 hours in the morning. As shown in “15.5.3.2. Traffic and Public Facilities”, the future traffic volume is as follows:

unit: vehicles/hour

Time	Survey point A		Survey point B		Survey point C	
	small	large	small	large	small	large
9:00-10:00	41	119	7	5	2	51
10:00-11:00	47	127	12	8	2	64
11:00-12:00	55	138	13	4	2	58

Note: Survey point A : Access road to Tekke Village in front of the company
Survey point B : Access road to Tekke Village from the junction
Survey point C : Access road to Cimsa site from the junction

On assumption that the widths of every road are as follows and velocity is 40km/ hour on average, the noise levels were calculated.

Point A : 12m
Point B : 6m
Point C : 8m

The formula for noise prediction is as follows:

$$Leq = 10 \log_{10} (\Sigma 10^{Ui/10} \cdot \Delta t \cdot N / T)$$

N: Traffic volume (vehicles / hour)
Ui: Sound pressure level which reaches the prediction point from noise source of No.i
$\Delta t = \Delta D / V$
ΔD: Interval of noise source point
V: Velocity of vehicles (km / hour)
T = 3,600 (seconds)

The result is as shown in Table 14-36. The noise level in 2005 will be almost equal to the standards for Zone III or IV defined as follows:

Zone III: City-centre residential area, main roads, workplaces (20m from traffic flow) ; 55-65 dBA

Zone IV: Industrial zone or main roads where heavy vehicles and buses pass; 60-70dB(A)

Therefore, the impact on the area along the access road will be negligible.

Table 14-36: Traffic Noise Level in 2005

Unit: dB(A)

Time	Survey point A	Survey point B	Survey point C
9:00-10:00	66.3	56.6	63.8
10:00-11:00	66.6	58.0	64.9
11:00-12:00	67.1	67.1	64.4

b.2 Positive Impact

Positive impact is not expected.

c. Aftercare

No impact from noise is expected.

14.5.3.12.2 Vibration

Vibration levels due to landfill equipment and waste collection vehicles have not been estimated by any theoretical method. Instead, the noise level results are considered to be indicative of vibration levels.

a. Construction

a.1 Negative Impact

The impact by vibration from the construction equipment and the vehicles transporting the materials for construction is expected to be negligible because the impact by noise owing the construction is also expected to be negligible.

a.2 Positive Impact

Positive impact is not expected.

b. Operation

b.1 Negative Impact

The reduction of vibration in accordance with the increase of distance is generally expected like that of noise. The impact by vibration from the equipment for operation and waste collection vehicles is expected to be negligible because the impact by noise owing to the operation is likely to be negligible also.

b.2 Positive Impact

Positive impact is not expected.

c. Aftercare

No impact from vibration is expected.

14.5.3.13 Offensive Odour

Generation of offensive odour from the compost plant, the sorting plant and the landfill site.

a. Construction

a.1 Negative Impact

During this stage, the production of offensive odour from construction activities, especially exhaust fumes from earth moving equipment and trucks will be negligible due to the open nature of the area and the long distance almost 1,000m from the construction site to the residential area.

a.2 Positive Impact

As the existing dumping site is closed, the offensive odour will be terminated.

b. Operation

b.1 Negative Impact

A low negative impact may result from the handling of waste at the compost plant, the sorting plant and the disposal site.

b.1.1 Compost Plant

At the compost plant, the offensive odour is produced at the waste reception section and on the compost production process. A large proportion of the waste to be handled at the compost plant will be organic in nature and it will decompose during 1 month. In the reception section, air is drawn and deodorised as described below in the maturation area.

The compost plant is situated in the closed building and air suction system is installed under the floor of the static pile in order to supply the oxygen into the waste. When the air goes into the perforated pipes under the floor through the waste, offensive odour is also taken into the perforated pipes. After offensive odour is gathered into the main pipe by the blower, it is sent to the maturation area and deodorised through the floor installed with deodorization system. Therefore, the offensive odour from the compost plant is minimal.

b.1.2 Sorting Plant

The offensive odour at the sorting plant is produced less than at the compost plant because a large proportion of the waste handled at the sorting plant is not organic in nature. The sorting plant is located in the building to prevent the offensive odour leaking outside. As air quality in the waste reception section and the hand-sorting section is deteriorated by odour from waste, a ventilation system will be provided. Air is drawn from the waste reception section and the hand-sorting section, and sent to the deodorization system prepared in the site. In order to improve the environment for workers, fresh air is to be sent through several blowers. Therefore, the impact by offensive odour will be negligible.

b.1.3 Waste Disposal Site

In the waste disposal site organic wastes are decomposed and offensive odour is produced. However, the tipping front will be relatively small and waste will be deposited, compacted and covered with soil daily. These practices should minimise offensive odour problems.

b.1.4 Leachate and Landfill Gas

Offensive odour will also result from the production of leachate and landfill gas. Leachate will be collected within the treatment ponds or regulation pond where some of it will evaporate. However, most of the leachate will be circulated to the disposal site through the pipe by the pumping system. The circulation pipes are installed under the cover soil to prevent the offensive odour dispersing into the air. Hence, offensive odour from leachate should not be problematic. Similarly, landfill gases should not cause a significant odour problem as they will ventilated in a controlled manner and will be dispersed by the wind.

b.2 Positive Impact

Positive impact is not expected.

c. Aftercare

c.1 Negative Impact

Leachate and landfill gases will continue to be produced during the aftercare stage after the termination of operation although production rates and strengths will diminish with time. Some offensive odours may be experienced from the venting of landfill gases. However, this impact is likely to be minor.

c.2 Positive Impact

Positive impact is not expected.

14.5.4 Conclusion of Impact

On the result of environmental assessment of impact, the following impacts should be considered carefully even if mitigation measures would be applied.

Table 14-37: Impacts to be considered

Phase	Factors of Impact
Construction	• Dust from earthworks • Flood
Operation	• Gas, Fire, Offensive Odour and Safety at disposal site • Leachate from medical waste disposal site • Offensive Odour from compost plant
Aftercare	• Gas, Leachate and Offensive Odour from disposal site • Leachate from medical waste disposal site

a. Construction

a.1 Dust

On the stage of construction, the impact by dust and flood should be considered carefully. Dust during earthworks will be controlled by water sprays. Water tank truck has to stand by always during dry season and meteorological information especially of wind should be transmitted to the workers in advance. When the wind is too strong to give significant impact on the surrounding area, it is necessary to stop the earthworks. In any case the appropriate supervision and control of earthworks are indispensable.

a.2 Flood

In this project the water way is to be improved in order to make the rain water on the impermeable clay of phase 1,2,3 and on the impermeable sheet of medical waste disposal site discharged. However, when a local downpour happens, the downstream area may be possibly suffered from flood. It is expected that flood can be avoid by construction of green buffer zone. Therefore, before the construction of phase 1 and phase 2, buffer zone should be constructed and covered with green trees. Green zone can increase the water retaining capacity of the land and store most of rainwater in the zone without discharging outside. The construction of green zone can reduce the impact on the surrounding area.

Increased volume Decreased volume
10ha x (100% - 70 %) > 4.5ha x (70% - 30%)
* 10ha : area covered by impermeable clay and sheet

*100% : run-off coefficient of impermeable clay and sheet
*70% :run-off coefficient of existing land
*4.5ha :area of buffer zone
*30% :run-off coefficient of buffer zone

b. Operation

b.1 Gas and Fire, etc. at Disposal Site

Generation of gas, outbreak of landfill fires, production of offensive odour and safety control depend on the management of sanitary landfill. The manager of this work should be trained enough and supervise strictly the relevant workers. As for gas, the ventilation system will be installed and gases will be dispersed in the air. Although the proposed site is open widely and suitable for gases to diffuse, the workers should be careful not to deal with fire(e.g., cigarette) in the site because the gases are inflammable.

To eliminate the landfill fires and offensive odour, it is indispensable to cover the waste with soil every day. Therefore, whether the covering is complete or not should be inspected by the manager at the end of daily works.

b.2 Leachate from Medical Waste Disposal Site

The impact of leachate from medical waste disposal site must be inspected strictly because the leachate may be significantly polluted by infectious and hazardous waste. The water quality in the monitoring well in the surrounding area should be analysed regularly, and once the unusual values are found, the operation must be stopped and all processes for medical waste disposal examined.

b.3 Offensive Odour from Compost Plant

Offensive odour from compost plant is to be inspected once a month. The effectiveness of deodorization system in maturation area should be often examined and it is necessary to control not to send too much air from static pile and reception section.

c. Aftercare

c.1 Gas, Leachate and Offensive Odour from Disposal Site

Gases and leachate will continue to be produced after the termination of operation although production rates and strength will diminish with time. The water quality in the wells in the surrounding area should be inspected regularly and gases should be also monitored.

c.2 Leachate from Medical Waste Disposal Site

The water quality in the monitoring wells should be inspected regularly and strictly according to the monitoring program, because there is possibility of polluted water flowing out of the site.

14.6 Alternatives of the Project

The city plan for the surroundings of the present landfill site is in great contradiction with the landfill. Immediately south and west of the site are existing or planned

housing areas and 500m to the east is a new housing area under construction. Thus, it will be very difficult to operate a landfill on this site for many more years. It is recommended that the present landfill be closed and rehabilitated as soon as possible. Mersin Greater Municipality presented the following 5 candidate sites:

1. CIMSA-site
2. Quarry at Hebilli
3. Old Soda Quarry
4. Old CIMSA Quarry
5. Quarry at Emirler

This section of the report describes and evaluates the candidate disposal sites for Mersin GM. Recommendations on the future landfill site for Mersin are also included.

The locations and photos of the candidate sites pointed out by the Municipality are presented in Figure 14-49 to Figure 14-51 .