CONTENTS

• SOLID WASTE GENERATION

• EXISTING SOLID WASTE MANAGEMENT IN NEGARA BRUNEI DARIUSSALAM

• TOWARDS INTEGRATED SOLID WASTE MANAGEMENT

• SOLID WASTE COLLECTION & SOME EFFORTS ARE BEING IMPLEMENTED

• SOLID WASTE DISPOSAL & EFFORTS ARE BEING IMPLEMENTED
SOLID WASTE GENERATION
BASIC FACTS

Year 2005
Population: ~ 350 000
Growth rate: 2.4%
Average disposal of waste per capita: ~ 1.4 kg/person/day
Waste generation: 189 000 ton per year

[Review: LTL Resources 2005]

Year 2024
Population: ~ 526 000
Estimated waste will be managed in 20 years projection: ~ 4.5M ton
Total Waste to be Managed Over 20 Years: 4,500,000 tonnes

Total Population Today: ~350,000

Total Population in 20 years: ~526,000

unipotential, residential, commercial, no-hazardous industrial, construction wastes
Brunei-Muara District: 2005 Waste Composition

Municipal Waste Composition
(based on waste survey completed week of 11 April 2005)

- Food waste: 36%
- Paper: 18%
- Plastic: 16%
- Yard Waste: 6%
- Diapers: 6%
- Other: 5%
- Metal: 4%
- Glass: 3%
- Textiles: 2%
- Wood: 1%
- E-waste: 1%
- Inert: 1%
- Rubber: 1%
- Mixed Residential, Institutional & Commercial: 77%

Total Waste Stream Estimate
(based on vehicle count completed week of 25 January 2005)
- Mixed Residential, Institutional & Commercial: 77%
- Yard & Landscaping: 6%
- Land Clearing: 5%
- Construction & Demolition: 5%
- Soil: 5%
- Sewage: 1%
- Tires: 1%
- Inert: 1%
- Rubber: 1%
- E-waste: 1%
- Wood: 1%
- Glass: 3%
- Other: 5%
- Paper: 18%
- Plastic: 16%
- Yard Waste: 6%
WASTE GENERATION

• RESIDENTIAL
  [ private dwellings and high rise flat ]

• COMMERCIAL
  [ shop houses, restaurants, market, open market, bank ]

• INSTITUTIONAL
  [ schools, hospitals, government office buildings ]

• INDUSTRY
  [ Goods manufacturing factories and storing or warehouses ]

OTHER WASTES:

waste soil; construction wastes; toxic wastes and hazardous wastes; waste oil or used oil
EXISTING SOLID WASTE MANAGEMENT SYSTEM IN BRUNEI DARUSSALAM
EXISTING SOLID WASTE MANAGEMENT SYSTEM

Waste Generation

Generating wastes
Residential / Commercial / Industry / Institutional

Recycling Companies
Private Individual
Private Companies
Government Sector

Indiscriminate Dumping
Open Burning

Waste Collection

Waste Bin Centres & Electrical Compactor

Recycling

‘Scavenging’

Marketed at Domestic and Abroad level

Landfill Site

Not all wastes can be collected and dispose at Landfill Sites

Recycling

Road Side, Drain, Drainage Systems, Building perimeter etc.

In the process of updating and improving the system

Institutional work program
TOWARDS THE INTEGRATED SOLID WASTE MANAGEMENT
INSTITUTIONAL FRAMEWORK
- Capacity Building
- Organisational Set-up
- Policies & Regulation
- Enforcement

WASTE GENERATION
Public Awareness Programme

DISPOSAL
- Improve interim operations of disposal sites
- Proper Closures and Rehabilitation
- Environmental Monitoring
- Engineered Landfill

COLLECTION
- Develop & Improve Services
- Develop & Implement Tariffs
- Public Awareness Programme

WASTE REDUCTION
- Composting
- Recycling
- Incineration

TRANSFER
Develop Transfer Facilities
Regional / Kg Air

Integrated Waste Management System
SOLID WASTE COLLECTION
WASTE COLLECTION

• PRIVATE INDIVIDUAL DISPOSAL TO LANDFILL SITES & WASTE CENTRES

• HOUSE TO HOUSE COLLECTION
  - Brunei Muara
  - Kampong Air

• REGISTERED PRIVATE WASTE COLLECTING COMPANIES
  - Brunei Muara
  - Commercial Areas
  - Light Industrial Areas

• WASTE BINS CENTRES
  - Electrical waste Compactor and skips in Brunei Muara
  - Skips and bins in Tutong
  - Bins in Temburong
  - Skips in Seria & Belait

• UNREGISTERED PRIVATE COLLECTING WASTE COMPANIES
<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>PUBLIC SECTOR HAULERS</td>
<td>26 %</td>
</tr>
<tr>
<td>REGISTERED &amp; APPROVED HAULERS</td>
<td>34 %</td>
</tr>
<tr>
<td>UNREGISTERED HAULERS (including self haul)</td>
<td>40 %</td>
</tr>
</tbody>
</table>
REGISTERED & APPROVED HAULERS

1. Sisco Simin Company
2. Kyoei Buildmaintenance Sdn Bhd
3. MBJ Services
4. Rome Suri Enterprise
5. Mashhor General Contractor Sdn Bhd
6. Syarikat Hamsal & Anak-anak
7. Syarikat Pg Hjh Patimah & Anak-anak

Total Zone : 19 Zones
EFFORTS ARE BEING IMPLEMENTED
- TO TAKEOVER TASKS & RESPONSIBILITY OF THE SERVICE STAGE BY STAGE

- TO IMPROVE EFFICIENCY AND STANDARD OF COLLECTING SERVICE FOR TUTONG AND TEMBURONG DISTRICTS:
  - COLLECTION CONTRACT DOCUMENTS
  - IMPLEMENTATION IMAGE AND STATUS OR POPULARITY
  - FREQUENCY OF COLLECTION
  - USAGE OF WASTE COMPACTOR TRUCK
  - MONITORING
  - MEETING WITH HEAD VILLAGE LEADERS
- To implement waste collecting projects through ‘departmental’
- To review collection zones in Brunei Muara district
- Planning for National Development Plan (RKN) 9 projects
<table>
<thead>
<tr>
<th>BRUNEI MUARA</th>
<th>TUTONG</th>
<th>BELAIT</th>
<th>TEMBURONG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collection and Transporting service for house to house waste manage by Dept. of Environment, Parks &amp; Recreation (JASTRE)</td>
<td>19 Waste bin Centres + 7 bus stop manages by the Dept. of Environment, Parks &amp; Recreation (JASTRE)</td>
<td>Collection is still manage by Belait District Office Except all waste collection manage by Public Works Dept. (JKR)</td>
<td>All solid waste collection centres</td>
</tr>
<tr>
<td>Transfer by Municipal Board BSB 1st April 2004</td>
<td>Transfer by Tutong District Office 26th January 2005</td>
<td>Transfer by Public Works Department 1st April 2006</td>
<td>Transfer by Temburong District Office 15th September 2005</td>
</tr>
</tbody>
</table>
SOLID WASTE DISPOSAL
Municipal Solid Waste Landfill Sites

1. Sg Akar, Brunei Muara
2. Bukit Udal, Tutong
3. Sg Burung, Tutong
4. Anduki, Seria
5. Dua-o-Dua, Seria (Eng. Private own)
6. Kg Rubada, Temburong
Sungai Akar Brunei-Muara Landfill Sites
Sungai Akar Landfill Sites
Green wastes have been made for Composts as the Photos shows.
THANK YOU