



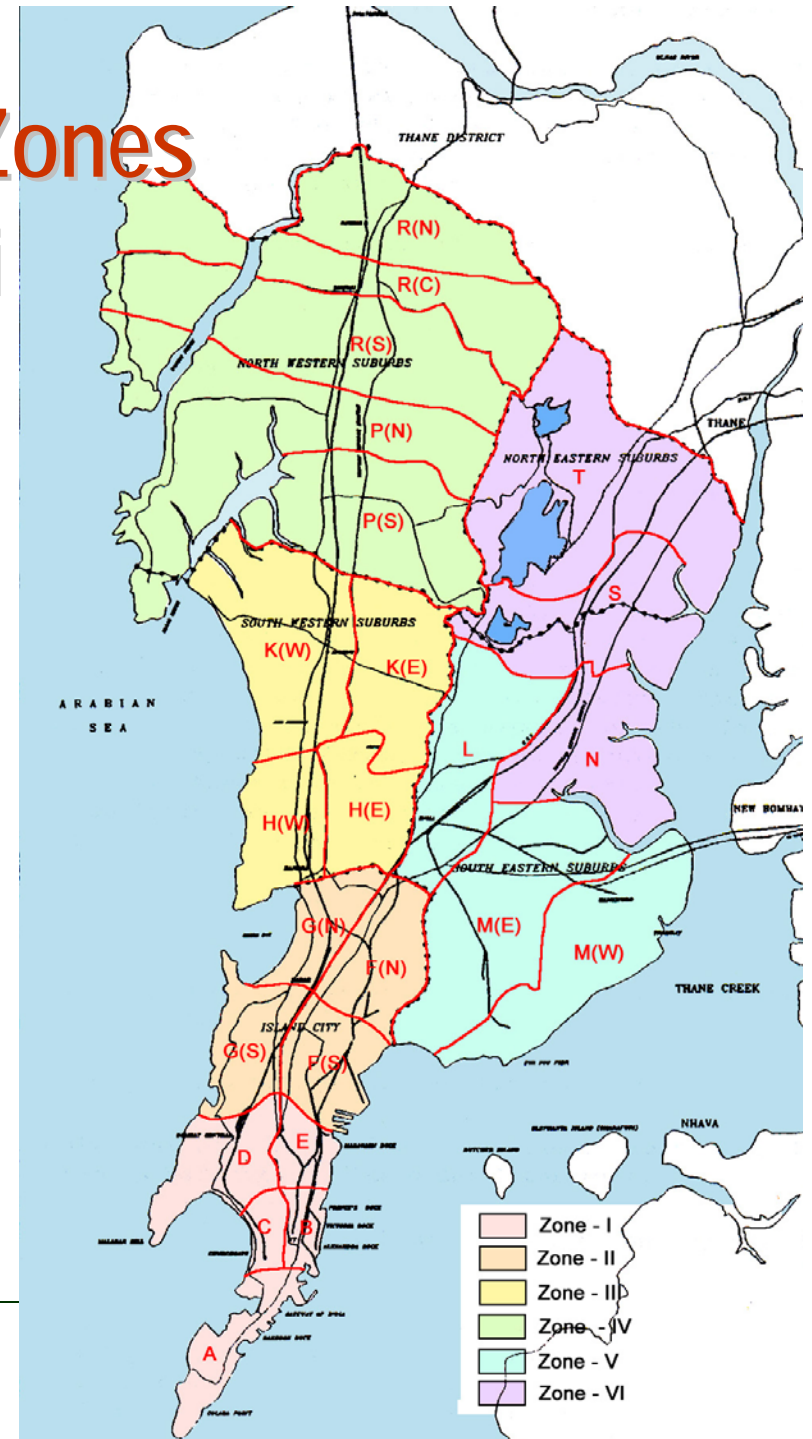
Public Private Partnership for Scientific Management of Landfill Sites of Mumbai

Clean-up 
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Administrative Zones of Mumbai

- **Zone I**
 - Wards A, B, C, D, E
- **Zone II**
 - Wards F(N),F(S),G(N),G(S)
- **Zone III**
 - Wards H(E),(H(W),K(E),K(W)
- **Zone IV**
 - Wards P(N),P(S),R(N),R(C),R(S)
- **Zone V**
 - Wards L, M(E),M(W)
- **Zone VI**
 - Wards N, S, T





Projected Population & MSW Generation

Year	Population (Million)	MSW (TPD)
2005	12.8	6,100
2010	13.6	7,100
2015	14.4	8,100
2020	15.3	8,900
2025	15.9	9,800
2030	16.2	10,500



Present Scenario of Waste Disposal

- **MSW is disposed at three disposal sites by open dumping**

Name of Site	Operational Since	Total Area (ha)	Height of Waste (m)	Future life (years)
Gorai	1972	19.6	25	-
Mulund	1968	25	18	2
Deonar	1927	132	20	8

- **A green field site of 141ha area at Kanjurmarg has been recently allotted by State Govt.**



Layout of Gorai Disposal Site



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Layout of Mulund Disposal Site



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Layout of Deonar Disposal Site



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Scientific Management Plan for Landfill Sites

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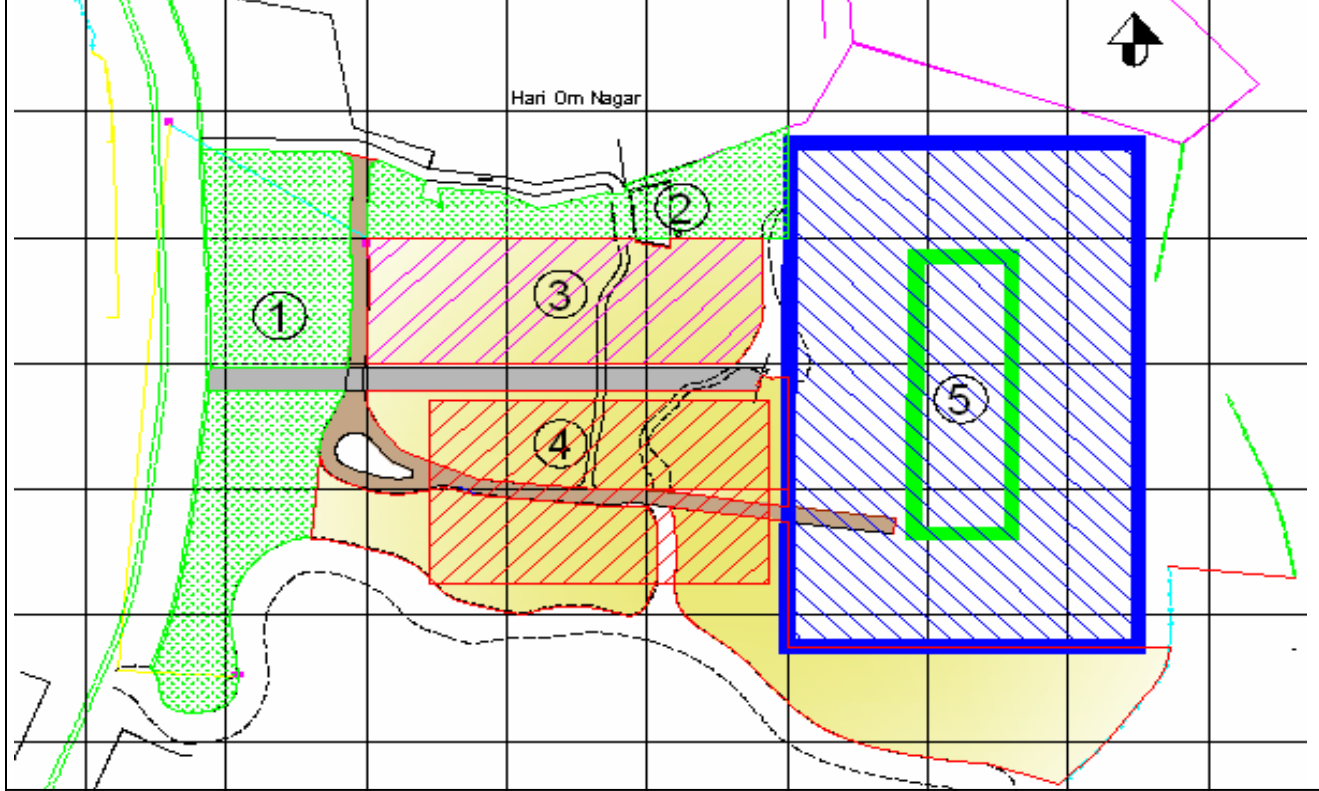


Background








- **Treatment and Disposal are areas of major deficiencies in SWM in Mumbai**
- **A comprehensive solution addressing long term (25 years) need for management of MSW and C&D waste was required.**
- **MCGM awarded a detailed study to IL&FS in July 2005 for development of integrated treatment and disposal plan for Mumbai**



Site Management Plan for Mulund



LEGEND:

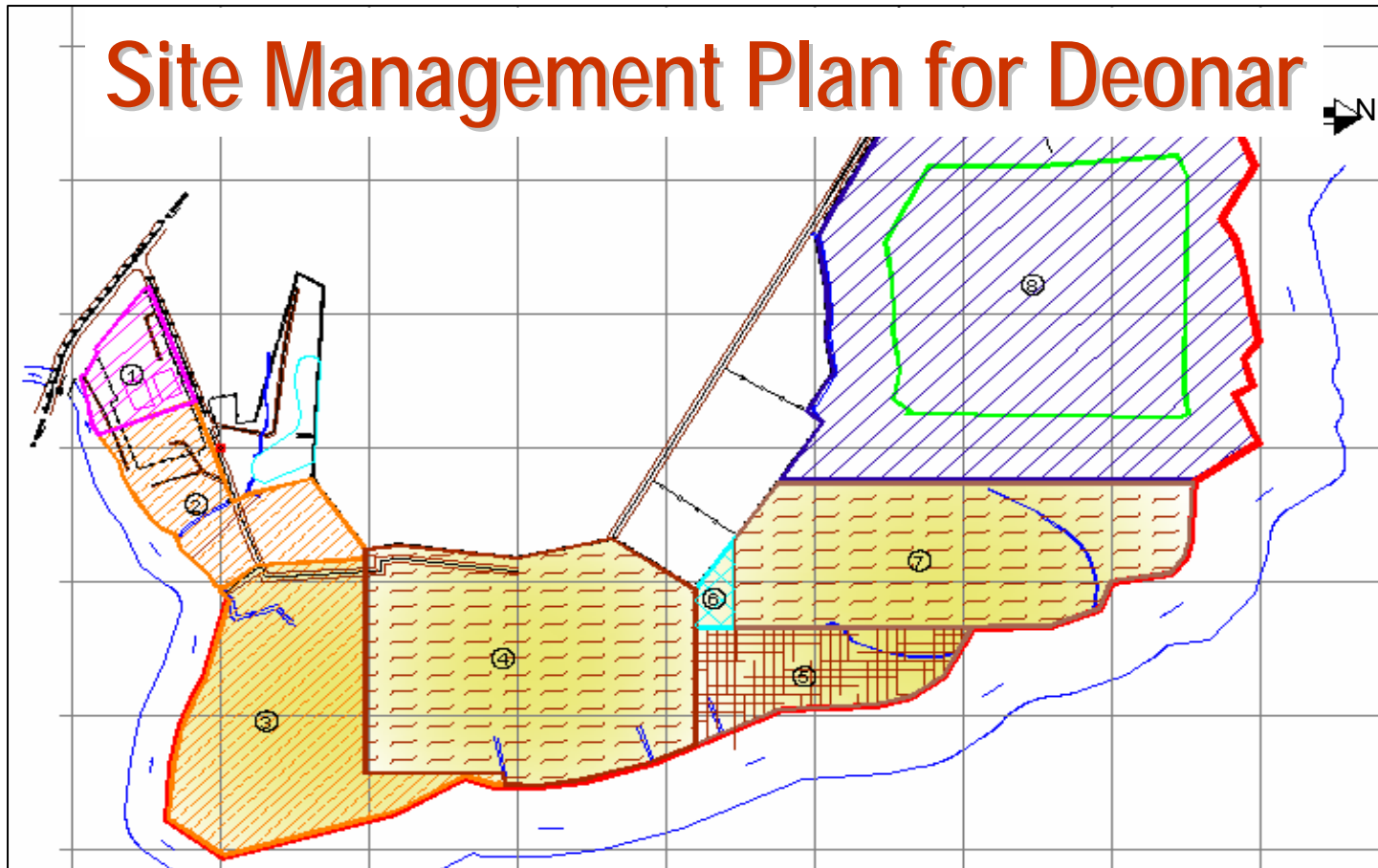
	Proposed Access Road		Area to be Partially Closed
	Existing Road		MSW to be Relocated
	Green Belt		Finished Top
	Site for Biomethanation Plant		Future Expansion & Emergency Operation

Site Allocation Index:

1. Green Belt I	- 03.50 Ha.
2. Green Belt II	- 01.50 Ha.
3. Area for Emergency Operation	- 02.75 Ha.
4. Site for Biomethanation Plant	- 03.50 Ha.
5. Area Proposed for Landfill	- 10.00 Ha.
6. Site for Unused	- 03.75 Ha.
Total Area	- 25.00 Ha.



Site Management Plan for Deonar



LEGEND:

- | | | |
|---------------------|-----------------------------|-----------------------------------|
| Access Road | Area to be partially closed | Alignment of Bund With Side Drain |
| Site for Future Use | MSW to be Relocated | Finished Top |
| Area for Composting | Leachate Treatment Area | |
| Landfill Area | Leachate Collection Area | |

Site Allocation Index

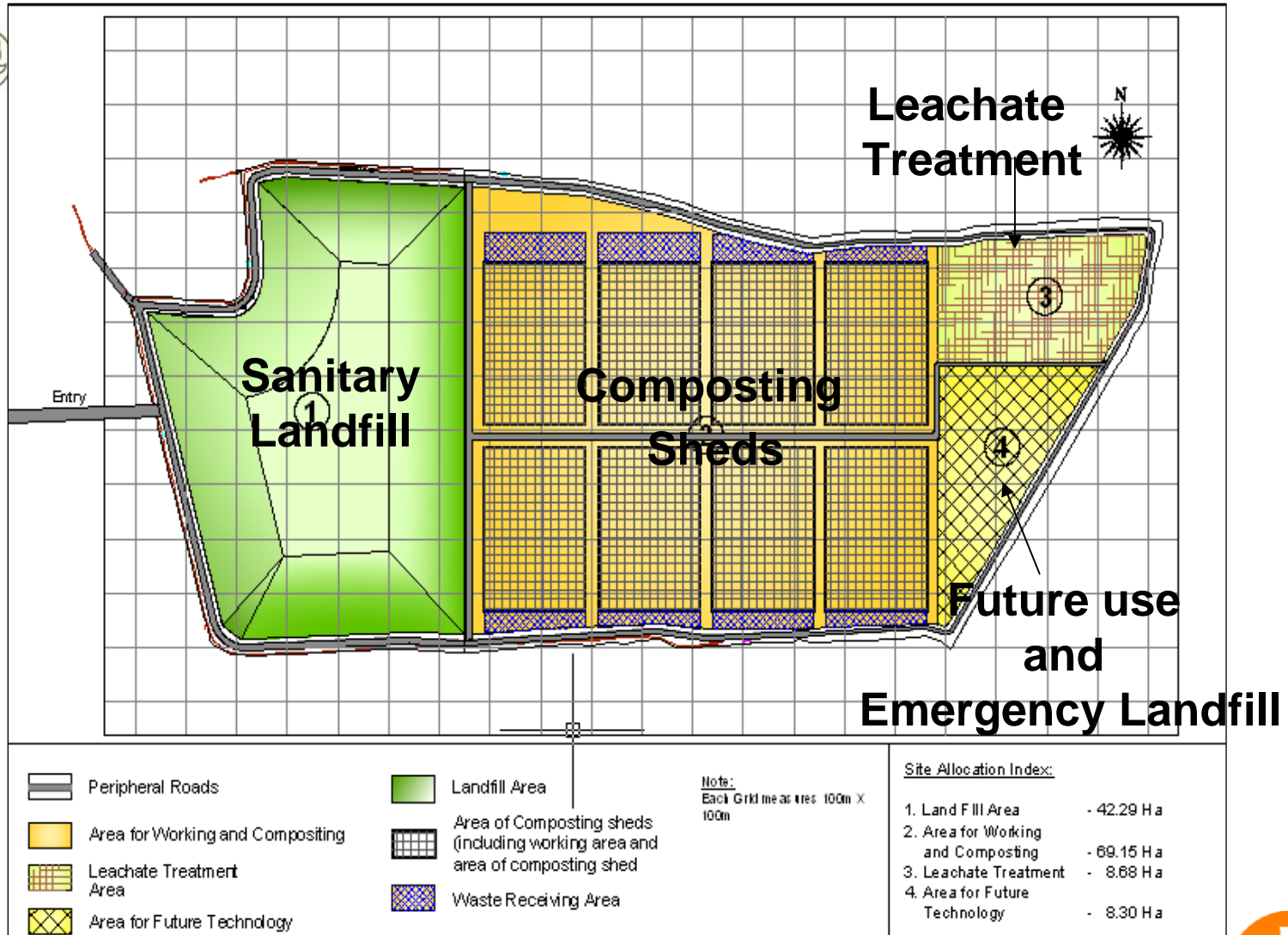
1. Site for Future Use	- 003.00 Ha.
2. Composting Unit I	- 007.00 Ha.
3. Composting Unit II	- 015.50 Ha.
4. Landfill Phase II	- 022.50 Ha.
5. Leachate Treatment Area	- 006.50 Ha.
6. Leachate Collection Tank	- 000.80 Ha.
7. Landfill Phase I	- 018.50 Ha.
8. Area to be Partially Closed	- 050.00 Ha.
Total Area	- 123.80 Ha.

Management Plan for Deonar Site





Site Management Plan for Kanjur





Strategy for Waste Management

Site	Waste Allocation (tons)	Total Area (ha)	Closure Needs (ha)	Available for future (ha)	Proposed Waste Processing Technology
Mulund	500	20	11	9	Bio-methanation
Deonar	2,000	132	52	80	Composting
Kanjur	4,000	141	Nil	120	Composting
Gorai	-	20	18	2	Scientific Closure
Total	6,500	313	81	211	-



Sanitary Landfill is common to all the technologies selected **MUMBAI**



Approach adopted

- **A Public Private Partnership framework for implementing the projects.**
- **Partial closure of the site and clearing of existing waste considered as a separate project for bidding**
- **An integrated waste management facility would be bid out for each of the sites comprising of waste processing facilities (including for C&D Waste), SLF and closure**



Contractual Structure

- **Landfill Closure Contract for Gorai**
- **Concession Agreement for**
 - Deonar
 - Mulund
 - Kanjur Village



Concession Agreement

- Deonar
- Mulund
- Kanjur Village



Broad Structure

- **Exclusive grant of concession for implementation and operations of the Project during the concession period**
- **Assured quantity of waste supply to each of the sites**
- **Assured quality of waste in terms of Organic Fraction and level of key contaminants**
- **Review of technologies option available after a defined time period**
- **Payment of service charges (tipping fees) by MCGM on a per ton basis**
- **Concessionaire have the right to sub-contract any activities subject to retaining the responsibility for the work done**



Payment Structure

- **Contractor to be paid Service Charges (Tipping Fees) for management of incoming waste**
- **Sharing of CDM revenues (up to 50%)**
- **Rate Contract (fixed unit rate for works, payments based on measurements of works completed) for partial closure and infrastructure development**
- **Mobilization Advance**
- **Monthly payment schedule based on milestones**
- **Payment for operations and maintenance of partial closure area**



Supervision and Monitoring

- **Monthly progress reports from the Contractor**
 - Status of progress of Works
 - Quantity
 - Percentage of the whole
 - Value
 - Quality assurance, test results and certificates
 - Safety statistics and environmental performance monitoring
 - Comparison of actual v/s planned progress
 - Details of unresolved disputes/claims
 - Details of revision in cash flow estimates
- **Appointment of Independent Engineer (third party)**
- **CDM validation, measurement, registration, monitoring and reporting**



Obligations of Concessionaire

- **Implement and operate the Project as per agreed plan during the concession period**
- **Receive and manage agreed quantity of waste 365 days a year**
- **Mobilize resources for the Project**
- **Implement and Operate the Project as per agreed performance standards**
- **Comply with relevant provisions of environmental and all other related laws**
- **Obtain all necessary approvals and permissions for the Project during the period of concession**



Terms Binding Operator

- **Provision of performance security**
- **Operations to meet defined performance standards**
- **Minimum standards for process outputs**
- **Measures to check quantity going to landfill**
- **Liquidated damages in the event of delay/defaults**



Obligations of MCGM

- Grant concession to the selected operator for the Project for its implementation and operation
- Provide access roads to the site
- Provide water and power connection to the site (Concessionaire to pay for the power and water consumed)
- Obtain CRZ, AAI and environmental clearance for proposed development
- Indemnify the concessionaire from environmental liabilities due to past operations
- Facilitate fund raising efforts of the Operator



Land

- **Concessionaire to be vested with the complete and lawful right, title and vacant possession of the Site by MCGM**
- **Execution of land lease agreement along with Concession Agreement**
- **Lease of Site to be co-terminus with the Concession Agreement**

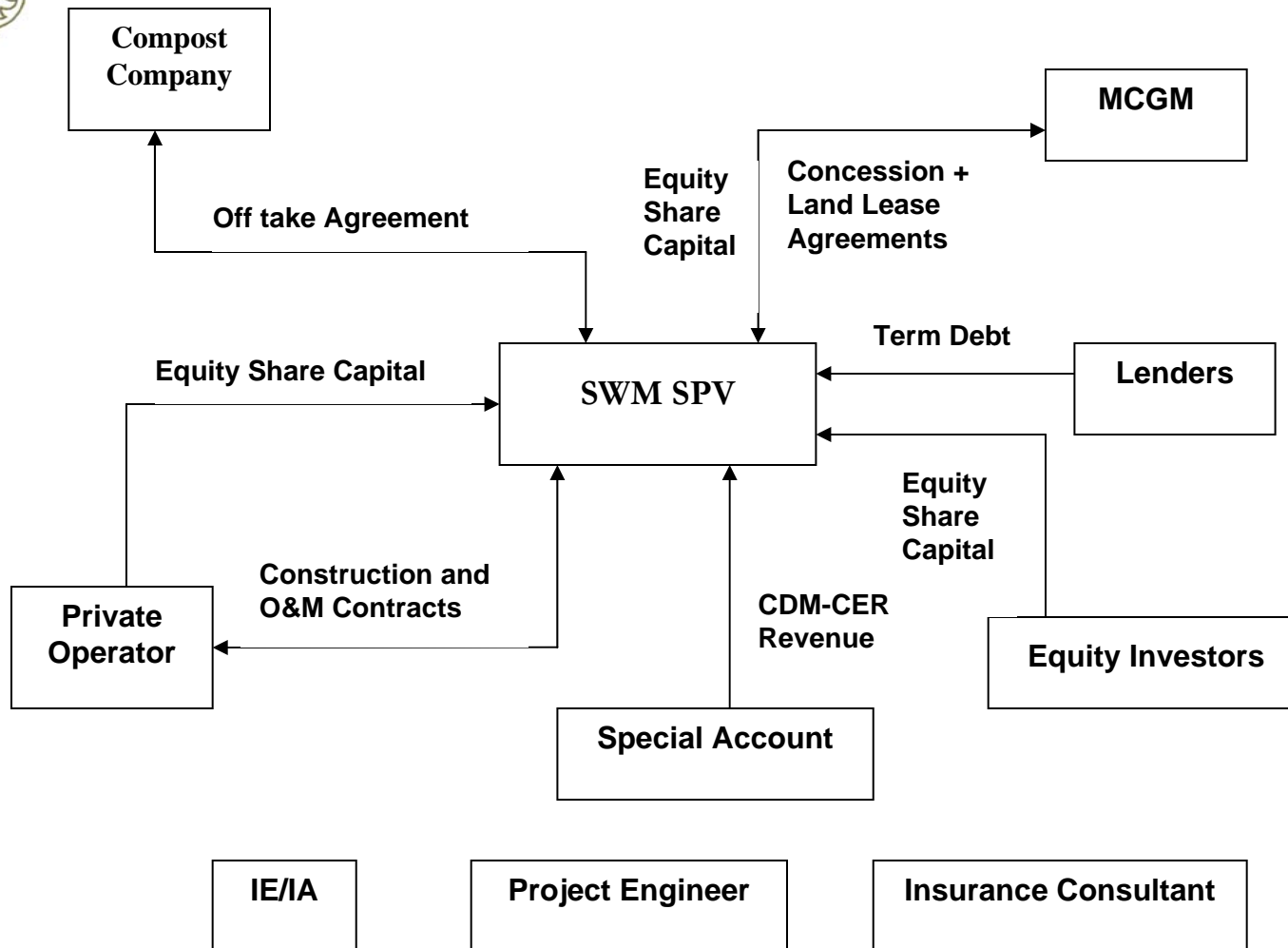


Payment Mechanism

- **A special budget provision is proposed for payment of tipping fees to the selected operator**
- **The project will be funded from :**
 - Private operator
 - Grant funding available for the project from JNNURM
 - Revenue from Carbon Credits generated by the project
 - Allocation of funds from MCGM budget (Tipping fees)
 - Revenue from sale of products (compost and electricity)



Typical Project Structure





Bidding Strategy

- **Selection of private operator on Build, operate, maintain and transfer basis**
- **Concession period – 25 years**
- **Operators' Responsibilities**
 - Receive, process and dispose off waste received at the site during the concession period
 - Implement the facility within given timeframe and as per desired performance level
 - Mobilize funding for the project
 - Compliant with laws/rules
- **Operators' rights**
 - Rights over revenue from sale of process outputs
 - Partial CDM benefits
- **MCGM's obligations**
 - Make arrangement for delivery of waste at the site
 - Provide land at disposal site on lease during concession period
 - Payment of tipping fees



Pre-qualified bidders

- **SembCorp Env. Mgt. Pvt. Ltd., Singapore with SITA Env. Solns. Australia**
- **IVRCL Infrastructure and Project Ltd, Hyderabad with Enkem**
- **Veolia Environmental Services Asia Pvt Ltd, Chennai**
- **United Phosphorus Limited, Mumbai with End-I Ag Germany**
- **Antony Waste Handling Cell Pvt. Ltd, Mumbai with Modern Asia Environmental Holdings, Thailand**
- **Unity Infraprojects Ltd, Mumbai with Han-jeer Bio-Tech Energies Pvt Ltd.**
- **SPML, Delhi with SMEC Intl. Pvt Ltd**
- **ILISO/DSW, Durban with Garware**
- **Ambuja Cements Ltd., Mumbai with Eco-Save Systems Pvt.Ltd**
- **EA Infrastructure Operations Pvt. Ltd., Mumbai with AMA Italy, UDC Kuwait**
- **Ramky Enviro Engineers, Hyderabad with City of San Diego**
- **STRABAG-AG, Austria**



Proposed Capital Investment

(Rs. in Lakh)

Project Components	Proposed Cost	Funds Approved under JNNURM
▪Gorai	3,530.00	_*
▪Mulund	8,130.00	2,430.00
▪Deonar	17,620.00	11,020.00
▪Kanjur	16,720.00	3,620.00
Shifting of Transmission Towers at Kanjur	720.00	720.00
IEC, Training and Capacity building	700.00	_**
Preparation of DPR	200.00	0.00
Sub-Total	47,620.00	17,790.00
Cost for establishing project implementation mechanism and towards project preparation (as per CSMC approval in the 25 th meeting on 5.3.2007) at 0.5%.	---	89.00
TOTAL	47,620.00	17,879.00



Funding Pattern Approved

Grant of Funds (<i>Rs. in Lakh</i>)			
GoI (35%)	GoM (15%)	MCGM (50%)	Total
6,257.65	2,681.85	8,939.50	17,879.00

JNNURM Funds (35% of Rs. 178.79 crore) for:

- Re-development of existing dump sites to reclaim a portion of land and to close the dumpsite in accordance with MSW Rules

Private sector participation (Rs. 254 crore) for:

- Setting up Composting and Bio-methanation Plants, Building and maintaining the new Landfill Facilities



Regulatory Clearances Received

- **Environmental and CRZ Clearance - State and MoEF, GoI**
 - Deonar and Mulund
- **Environmental and CRZ Clearance - State**
 - Kanjur Village
- **In-principal Environmental and CRZ Approval – MoEF, GoI**
 - Kanjur Village
- **AAI Clearance**
 - Deonar, Mulund and Kanjur



Thank you

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