

Landfill Mining & Remediation



What is Landfill Mining

- Method to reclaim old MSW dumpsites.



How is it different from Capping?



- ❑ Reclaims land
- ❑ Land can be put to reuse
- ❑ No maintenance
- ❑ Permanent measure

Does the Rules allow Mining?



SWM Rules 2016

प्रीतिका सं. पी. टी. ११०-११०४११

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असाधारण

EXTRAORDINARY

भाग II—खण्ड 3—उप खण्ड (ii)

PART II—Section 3—Sub-section (ii)

प्रकाशित के द्वारा

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पर्यावरण, वन और जलवायु परिवर्तन विभाग

अधिसूचना

नई दिल्ली, ८ अप्रैल, २०१६

सं. १३६७(प)—द्वारा अधिसूचित प्रबंधन नियम, २०१६ का अन्तर्गत अधिनियम के पर्यावरण, वन और जलवायु परिवर्तन विभाग की अधिसूचना सं. सा.वा.मि ४६१ (प) तारीख ३ जून, २०१६ की तारीख के राजपत्र भाग II, खंड-3, उप खंड (ii) में उल्लिखित की प्रकाशित किए गए थे, किन्तु उनमें प्रकाशित होने वाले संशोधित अधिसूचना में कवरीय लेख अधिसूचित (प्रबंधन और हस्ताक्षर) नियम २००० को संशोधित करने हुए उक्त अधिसूचना के द्वारा उक्त अधिसूचित प्रबंधन नियम, २०१६ के अन्तर्गत की तारीख में सारा रिपोर्ट की अधिसूचना की प्रकाशित में पूर्व अखण्ड और अखण्ड अधिसूचित किए थे।

उक्त राजपत्र की प्रतियां जलवायु को तारीख ३ जून, २०१६ को उपलब्ध कराई गई थी;

किन्तु अधिसूचित के बीच उक्त अधिनियम विधियों का अन्तर्गत अधिसूचना तथा विधियों पर केन्द्र सरकार द्वारा समय-समय से विचार किया गया था;

पर्यावरण (संरक्षण) अधिनियम, १९८६ (१९८६ का २०) की धारा ३, ६ और २६ द्वारा दत्त शक्तियों का उपयोग करते हुए और तारीख उक्त अधिसूचित (प्रबंधन और हस्ताक्षर) नियम, २०००, उन शक्तियों के सिद्धांत अधिसूचित करने हुए किन्तु ऐसे अधिसूचितों में बदले किए गए हैं या किन्तु करने का कोई किया गया है, केन्द्रीय सरकार द्वारा अधिसूचना का प्रबंधन करने के लिए निम्नलिखित नियम प्रकाशित की अधिसूचना।

१. संक्षिप्त नाम और शक्ति—

(१) इन विधियों का संक्षिप्त नाम उक्त अधिसूचित प्रबंधन नियम, २०१६ है।

(२) के राजपत्र में इनके प्रकाशन की तारीख से प्रवृत्त होंगे।

Steps Involved

- ❏ Pre-assessment studies
- ❏ Stabilization
- ❏ Processing and Segregation
- ❏ Disposal
- ❏ Reclamation

Company Key facts



FORCEBEL

ZIGMA GLOBAL INDIA

- Has successfully reclaimed 12 acres from landfill sites and processed more than 200,000 meter cube legacy waste in India.
- Is currently operating a 300 MT per day plant in India.
- Is in the process of commissioning three more plants in India for landfill Mining.

FORCEBEL CO, SOUTH KOREA

- Has cleared more than 100 MSW sites in the World.
- Has processed more than 15,000,000 MT of legacy waste till now.
- Is recipient of Korean Prime Minister Award, President's citation.

Zigma- Kumbakonam Facility



Currently in operation

- Two units
- Capacity- 800 MT per day
- DBFOO Model
- Running since 2015
- Total quantity- 1.65 lakh tonnes

VIDEO

Forcebel- Incheon Cheongra Facility



Currently in operation

- Two units
- Capacity- 2600 MT per day
- DBFOO Model
- Running since 2016
- Total quantity- 10 lakh tonnes

VIDEO

Why us?



FORCEBEL



Integrated services

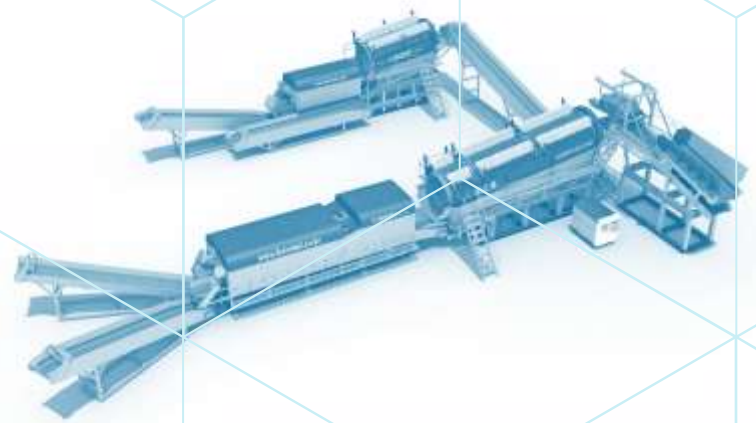
Why us?

Mobile Machinery



Processing Capacity- 1000 MT per day per line





**Land required : 0.5 acres
per unit**



DBFOO Model



FORCEBEL



Patented Machinery



- ✚ **Track conveyor that automatically inputs the waste into the system.**
 - Automatically inputs the same amount of waste consistently to achieve higher efficiency.
 - Sorts out metals upon input through a Magnetic Separator attached.



- ✚ **Removes soil content from the waste input into the system.**
 - Prevents clogging while processing wet waste through internally equipped blades which removes soil, and increases the efficiency of sorting.
 - Internally equipped Bar lifts the waste **180° and drops to further rid of soil from the combustible.**

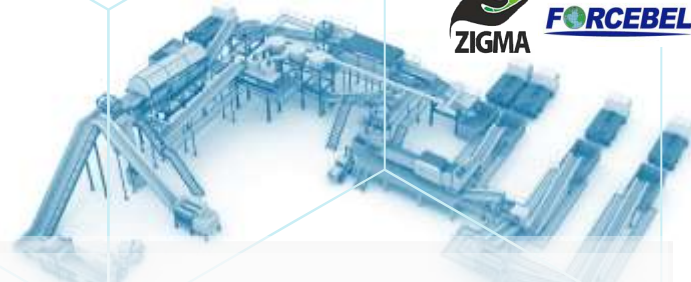


- ✚ **Separates the Combustibles from the Incombustibles.**
 - Multi-stage rotating rakes that sorts the waste.
 - Prevents noise and dust pollution; greatly decreasing social problems.
 - Mechanical Sorting System that achieves 98% efficiency



- ✚ **Sorts the soil output from the SUPEX Trommel Screen further removing contaminants.**
 - Prevents clogging by internal rotator and external rotator, and efficiently sort wet soil.
 - Utilization of special brush to remove contaminants from the soil.

Patented Machinery



[Shredder]

- ❖ Sorted combustibles will be shredded to 150mm first for RDF size limitation. This device has twin shafts with high durable blades and does right size shredding. Slow speed rotating helps to prevent overload and keep continuous working.



[Dual Striking Shredder]

- ❖ The Dual striking shredder works on cone type blades hitting materials in order to remove dust and moisture on wastes. Dual drums rotate in same direction and upper drum with blades takes input wastes then bottom blades strike them with high torque.



[Sun Flower Disc Screen]

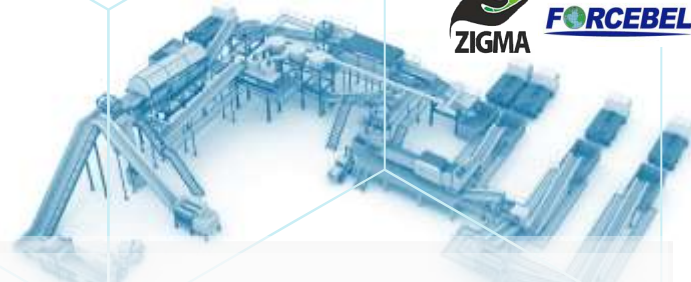
- ❖ Unlike other disc screens, Sunflower disc screen has urethane disc which shaped as sunflower and this material helps to purify combustibles. Using elasticity of urethane, discs hit combustibles strongly for cleaning dust and moisture on combustibles.



[Tornado Separator]

- ❖ The Tornado inhaler works for purifying combustibles by tornado wind. This wind work for in non-combustible output in order to increase recovery factor of SRF.

Patented Machinery



[Grinder]

- ❖ Sorted combustibles will be grinded again to 70~90mm for RDF size limitation. This device has twin shafts with high durable blades and lower 50mm screen. High speed rotating shafts with bottom screen do the right size grinding.



[Dryer]

- ❖ The Drum typed dryer is using direct heat injection with rotational drum. The drum has screw guide inside for high efficiency drying of SRF and the device is good for using waste heat from boiler.



[Precision Trommel Screen]

- ❖ The Precision Trommel Screen has 15mm screen hole and works for eliminating foreign matters in combustibles. Outer brushes help to prevent clogging screen holes.



[Baler]

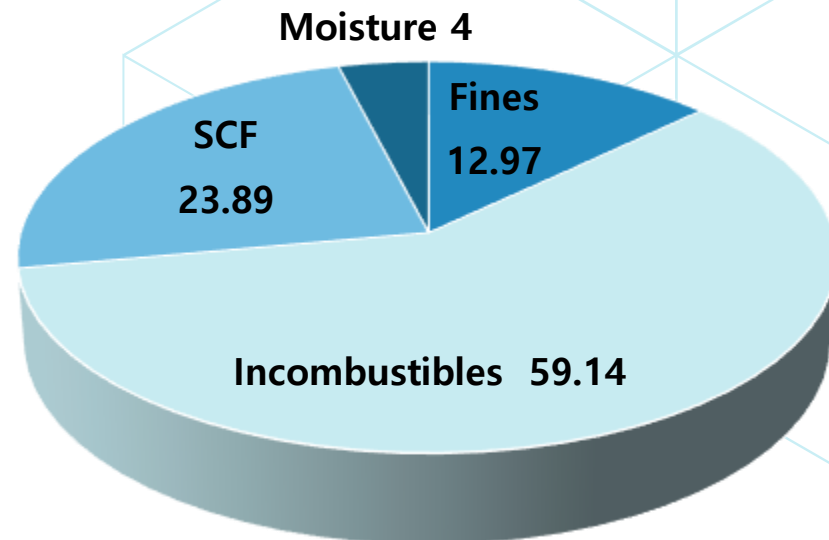
- ❖ The Baler works for Compacting and Pressing RDF's in order to transport and store in right place..

Mass Balance for Landfill Mining



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INPUT- 100 MT PRE STABLISED MSW	
OUTPUT: DESCRIPTION	OUPUT: PERCENTAGE
Fine Fraction for Re-use	12.70 MT
Incombustibles for earth filling low lying areas	59.14 MT
SCF/ Combustible Material	23.89 MT
Moisture Loss	4.00 MT



Case Study

Residential Area Development (Jeonju, South Korea)



Case Study

■ Sustainable Landfill Use (Yeosu Manheung, South Korea)



Case Study

Fresh Waste Processing Plant (Kumbakonam, Tamilnadu)



Case study with 5 plants



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Time Taken	Description
First 6 months	Statutory Clearances & Erection of Plant and Machinery
Year 1	7.8 lakh MT processing
Year 2	13 lakh MT processing
Year 3	13 lakh MT processing
Year 4	16 lakh MT processing

Final Product Application



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Inerts



Combustibles



Dome Installation



Separation Dome

Separation dome will be constructed when the project site is close to habitation area. This dome helps to prevent dust scattering and noise. Also, this helps to continue separation work without weather restrictions such as rainfall.



Leachate Treatment



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Mobile Leachate Treatment Plant will be set up on site to treat leachate that may be generated.

Stench & Dust Control



Stench and Dust would be controlled using manual and auto sprayers at all loading and unloading points.

Excavation Plan



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1	2		3
4	5	6	7
8	9	10	11

Excavation Plan

Excavation will start on section 1 and then details excavation plan as above.

Thank you