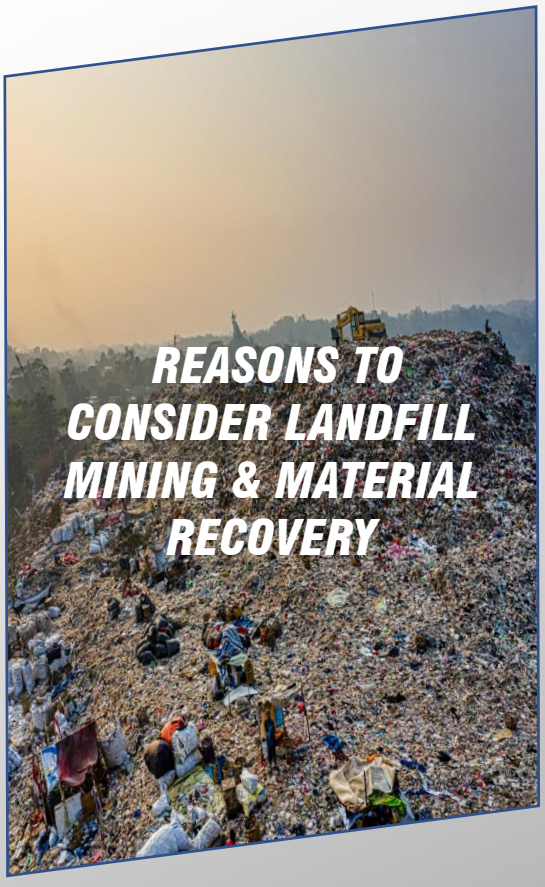
WHY LANDFILL MINING & MATERIAL RECOVERY?

- "EXTEND LANDFILL LIFE"
- UNLOCKED VALUABLE LAND POTENTIALS
- GENERATE INCOME
- RECOVER MATERIALS
- REDUCE CO_2 EMMISSIONS
- HELP CLIMATE CHANGE
- PART OF INTEGRATED WASTE TREATMENT FACILITY (IWTF)
- MORE EFFICIENT WASTE-TO-ENERGY (WTE)
- HELP FOOD SECURITY
- CIRCULAR ECONOMY
- JOBS CREATION
- CARBON REDUCTION INITIATIVE
- SUPPORT SUSTAINABLE DEVELOPMENT GOALS (SDG)



LANDFILL MINING

Landfill mining is the process of removing and processing solid waste from landfills to recover valuable materials, reduce the landfill's mass, and remove hazardous materials. The process can be used in both construction and municipal landfills.

Landfill mining can involve:

- ❑ **Excavating:** The waste is excavated from the landfill.
- ❑ **Sieving and sorting:** The excavated waste is processed through a series of machines that sieve and sort the materials.
- ❑ **Separating:** The materials are separated into different fractions, such as soil-like, combustible, and inert.
- ❑ **Evaluating:** The fractions are evaluated to determine if they are suitable for reuse, repurpose or energy recovery.

To expedite the flow of Landfill Mining, waste drying is added to the process. We use bio and nanotechnology for this purpose. Our proven process, ELMER; Enhanced Landfill Mining, Materials & Energy Recovery uses bio & nanotech with simple mechanical equipment.

PIOR ENERGY

Material & Energy Recovery

LANDFILL MINING PROJECTS

Our ELMER process at landfills involved bio-technology application & strict engineering process to convert waste to useful industrial products.

Sample products recovered from landfill:

Organo Minerals / Fertilizers

Metals

Textiles & Diapers Raw SRF/RDF

Soft & Hard Plastics

<u>Our services</u> include consultation on how our customers can conduct landfill extraction, provide landfill mining & extraction services to convert their waste into valuable products through simple material recovery process and help market their products to relevant buyers.

OUR TECHNICAL TEAM IS READY TO ASSIST YOU RECOVER MATERIAL FROM YOUR LANDFILL OR RECOVER PRODUCTS FOR YOUR NEXT ENERGY PROJECTS OR EXTEND YOUR LANDFILL LIFE.

APPLICATIONS

APPLICATIONS

LANDFILL MINING PROJECTS

By utilizing a simple separation method, the dried waste can be separated into valuable products. The cost and manpower required are minimal compared to any material recovery facilities and reduce huge capital expenditure therefore making this solution viable for smaller landfill. This extend the landfill lifespan and generate new income streams while improving Leachate Management & Treatment.

SIMPLE SEPARATION METHOD IS PROVEN TO SEGREGATE THE TREATED WASTE INTO VALUABLE PRODUCTS FOR INDUSTRIAL USE. GENERATE NEW REVENUE STREAMS FROM WASTE.

PIOR ENERGY

Material & Energy Recovery

LANDFILL MINING PROJECTS

Landfill Project Study (Active)
Windrows layout in Tapak Pelupusan Sampah (TPS) before Material Separation

Leachate Quality
After Treatment

Landfill Project Study (Active)
Windrows Formation in Tapak Pelupusan Sampah (TPS) Before Material Separation

Landfill Project Study (Closed Landfill)
Windrows Tagging in Tapak Pelupusan Sampah (TPS) Before Material Separation

APPLICATIONS

APPLICATIONS

LANDFILL MINING PROJECTS

Site Preparation and waste preparation.

Spraying bio-technology solutions on the incoming waste or legacy waste from the dumpsite / sanitary cells.

Forming windrows for the Bio Treatment Stabilization Method (BTSM) for 7-21 day with weekly monitoring on moisture, pH and acidity.

Windrows (120-125 MT of waste) are covered with liner and secured for the bio-drying process. PH, acidity, and moisture are monitored after 6th day.

PIOR ENERGY

Material & Energy Recovery

LANDFILL MINING PROJECTS

Windrows (120-125 MT of waste) are covered with liner and secured for the drying & stabilization process.

The treated waste will undergo the Bio-Treatment Stabilization Method (BTSM) with thermal process.

Weekly windrow monitoring to ensure the proper waste treatment process is in place before separation.

Waste is treated and ready for the separation process.

APPLICATIONS

CIRCULAR ECONOMY

Definition

The circular economy is a system where materials never become waste and nature is regenerated. In a circular economy, products and materials are kept in circulation through processes like maintenance, reuse, refurbishment, remanufacture, recycling, and composting.

Circulate Products and Materials

What if we could build an economy that uses things rather than uses them up? A circular economy favours activities that preserve value in the form of energy, labour, and materials. This means designing for durability, reuse, remanufacturing, and recycling to keep products, components, and materials circulating in the economy.

Circular systems make effective use of bio-based materials by encouraging many different uses for them as they cycle between the economy and natural systems.

Regenerate Nature

What if we could not only protect, but actively improve the environment? A circular economy avoids the use of non-renewable resources and preserves or enhances renewable ones, for instance by returning valuable nutrients to the soil to support regeneration, or using renewable energy as opposed to relying on fossil fuels.

WE SUPPORT CIRCULAR ECONOMY BY RECOVERING AND CIRCULATING MATERIAL FOR GREEN ENERGY GENERATION AND OTHER APPLICATIONS. ORGANIC COMPOST FOR FERTILIZERS.

PIOR ENERGY

Material & Energy Recovery

Sustainable waste management is a set of practices that aim to reduce the environmental and health impact of waste while also conserving natural resources.

REDUCE
RECYCLE
REUSE
REPURPOSE
RECOVERY

It involves:

- **Reducing waste:** Reducing the amount of waste created at the source
- **Recycling:** Collecting, processing, and converting waste into new products
- **Reusing:** Promoting the reuse of products
- **Repurpose:** Making the waste products as other means.
- **Recovering energy:** Converting non-recyclable waste into usable heat, electricity, or fuel.
- **Educating the public:** Raising awareness and providing education about responsible waste disposal and recycling.

Sustainable waste management can:

Reduce the amount of waste sent to landfills, Conserve natural resources, Reduce greenhouse gas emissions, Reduce pollution, and Provide economic and social benefits.

The Benefits of Adopting Sustainable Waste Management Practices Individuals, businesses, and governments can all work together to implement sustainable waste management practices.

Organizations can also signal their commitment to environmental improvement by adopting standards like ISO 14001:2015

TOWARDS SUSTAINABILITY

LANDFILL SOLUTIONS
WATER TREATMENTS
MATERIAL RECOVERY
CARBON REDUCTION
CLIMATE CHANGE
AGRICULTURAL
ENGINEERING SERVICES
GREEN ENERGY

PIOR ENERGY

MATERIAL & ENERGY RECOVERY