PREPARATION OF A SET OF TOOLS FOR THE SELECTION, DESIGN AND OPERATION OF HAZARDOUS WASTE LANDFILLS IN HYPER-DRY AREAS

GLOSSARY for Technical expressions and terms appeared in the Guidelines for hazardous Waste Landfills in Hyper Dry areas

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**Aerobic Decomposition:** Occurs in moist conditions in the presence of i.e. oxygen (produces strong leachate and no gas)

**Aftercare:** i) The steps necessary to bring the land to the required standard for the planned after-use, ii) The period after closure before the acceptance of surrender during which maintenance and monitoring work is needed to ensure that the restored landfill does not cause pollution of the environment, harm to human health or adverse effects on local amenities.

**Ambient Background (Water Quality):** Ambient background water quality refers to surface water sampled upstream or ground water sampled up-gradient of a landfill site. In both cases, these samples reflect water that has not been contaminated by leachate from the landfill.

**Anaerobic Decomposition:** Occurs in moist conditions in the absence of i.e. oxygen (produces landfill gas and weak leachate)

**Aquifer:** A geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs.

**Area fill:** A method of landfilling that compacts the refuse in cells and then uses soil cover to separate and cover the cells. This is typically done in layers and in separate phases.

**Area Method:** A method whereby non-putrescible waste is spread in layers not exceeding 0,5m in thickness. This method does not provide maximum compaction, but does have an application in certain industries.
Attenuation: Gradual reduction in concentrations of contaminants in leachate; *Attenuation* In the landfill context, is the process of reducing leachate concentrations by means of natural physical, chemical and biochemical processes such as dilution, oxidation and cell synthesis. Natural systems have an attenuation capacity which may render small volumes of contaminants (leachate) insignificant. However, when this capacity is exceeded, pollution results.

Audit Team: Those who attend the audit or site inspection and assist in compiling the audit report.

Audit: A site inspection at which the condition of the site on that day is appraised in terms of a number of predetermined criteria avoided.

Basel Convention: The international treaty that establishes standards for global trade of hazardous waste, municipal waste, and municipal incinerator ash.

BATNEEC: Best Available Technology Not Entailing Excessive Cost. The term ‘Best Available’ implies technology that is proven, accepted and accessible. ‘Technology’ refers to the process itself and how the process is implemented (including management). "Excessive cost" is cost effective in the context of the specific operation.

Bentonite: A type of soil that swells greatly in the presence of water. Because bentonite impedes the flow of water, it is used for liners, covers, and various other landfill applications.

Berm: An elongated pile of soil used to control and direct the flow of surface water runoff. Bems may also be used to block out noise and screen operations from public view.

Bill of Quantities: This is a list of the tasks involved and an estimation of the quantities of the materials needed for the construction of elements of the landfill design.
Biodegradable materials: Materials that can be broken down by microorganisms into simple, stable compounds such as carbon dioxide and water. Most organic materials, such as food scraps and paper, are biodegradable.

Biodegradable: Organic material which can be broken down chemically by biological action.

Borehole: A hole drilled to obtain samples (e.g. groundwater and leachate) and/or to sample for landfill gas migration.

BPEO: Best Practicable Environmental Option. BPEO is the outcome of a systematic consultative and decision-making procedure that emphasizes the protection of the environment across land, air and water. It establishes, for a given set of objectives, the option that provides the most benefit or least damage to the environment as a whole at acceptable cost in the long term and as well as the short term.

Buffer Zones: Buffer zones are separations between the boundaries of registered landfill sites and residential developments. They may vary between 500m and 1000m in width, depending on the classification of the landfill. No residential development may take place within a proclaimed buffer zone. At the discretion of the local authority and the state departments, however, developments such as industrial development may be permitted.

Bund: A small bank of soil or other inert material used to define limits of cells or phases or roadways. Not a structural embankment that may be required to retain waste or liquid, but may be a permanent part of a landfill base, incorporating a liner.

Canyon fill: A method of landfilling that is similar to area filling but is used primarily in mountainous terrain. Canyon fill landfills are typically much deeper than other types of landfills.

Cap: A layer of clay or other material to prevent ingress of rainwater.
Capping: The covering of a landfill, usually with low permeability material. Permanent capping is part of the final restoration following completion of landfilling/tipping. Temporary capping is an intermediate cap, which may be removed on resumption of tipping.

Cell: This is the basic landfill unit of compacted solid waste which, when completed at the end of each day, is entirely contained by cover material. The sides may be typically formed by 1.5m to 2.0m high soil or rubble berms, or sloped covered waste. Cell width is determined by the maneuvering requirements of vehicles depositing waste at the working face.

Channelling: This is a term used to describe the rapid flow of water through a waste body via preferential conduits or paths of least resistance. Channelling results in the early formation of low concentrate leachate prior to the waste body reaching its field capacity.

Characteristic Waste: Waste that is considered hazardous because it exhibits any of four different properties: ignitability, corrosivity, reactivity, and toxicity.

Clay Layer: A layer of clay applied to the base of walls of a site to prevent leachate or gas migration. Also applied to surface - see Cap.

Climatic Water Balance: The Climatic Water Balance refers to a simplified calculation, involving only figures for precipitation and pan evaporation, obtained from published data. It is used only to indicate the climatic conditions under which leachate management is needed, on account of the generation of significant leachate. Where no Site Specific Factors such as high moisture content waste and ingress of ground or surface water exist, the Climatic Water Balance coincides with the Site Water Balance. (See Site Water Balance and Water Balance).

Closure Requirements: Those measures that must be taken to address problem areas and to render a landfill environmentally acceptable once it is closed.

tطهير المنطقتين السطحية وتحييد تدفق النفايات خلال فترة التعبئة. وتعني بحرينة التنقيط النفايات بعد تسليم الدفن/التفريغ (Tipping). أما الخطوات الموقتة في عقبة على قسلة ووسيطة يمكن الأوردة على الإستعداد لاستئناف القتيبة.

الخلية
وهي وحدة الدفن الأساسية وتكون من نفايات صلبة/خطة مدرسة يستمر احتواءها بشكل كامل لمدة تنقيط عادة تستغرقاً نهاية كل يوم. وتكون الجوانب في الخلايا النافطة من حراص ركامية أو رياية بارتفاع 0.5 م أو من نفايات ملحمة مفطحة. ويتحدد عرض الخلية بناء على متطلبات المنطقة الخاصة بالمركبات التي تقوم بإيجاد النفايات على سطح (دوج) التشغيل.

عمل قنوات تحويلات
ويمكن استخدام هذا الإطلاق لوصف تصريف الماء السريع خلال كل النفايات عن طريق جانب فيضي أو مسال منخفضة المقاومة. وتأخذ الفوات إلى التكون المركب ليبقى التركيز قبل وصول كتلة النفايات إلى سطحها المبطن.

النفايات ذات الطبقة الخاصة
هي نفايات تحت خطرة لإحداثها واحدة من 4 خواص مختلفة وهي: قابلية الانتشار والسمية الحياتي/النحاس والتفاعل.

النافطة الطيفية
هي طائفة من الطائفة توضع على نافطة وجدار الموقع لمنع هجرة الرشيح أو الغاز كما يمكن وضعها على السطح أيضاً (أنظمة الفنر). 

التوازن المائي المناخي
ويشير إلى معدالة حسابية لمستوى تشمل فقط على أرقام تعبر عن التربيب / المطر الساقط والبحر الشامل وهو أرقام مستفنة من بيانات متضاربة. وتستخدم فقط لإشارة إلى الظروف المناخية التي تكون فيها إدارة الرشيح مطلوبة بسبب تولد كميات مؤثرة من الرشيح. وفي حالة عدم وجود عوامل خاصة بالموقع مجددًا (نكفيات ذات خصائص رطوبة مرتفعة ودخول الماء السطحي أو الجوفية إلى حجم النفايات) يطبق التوازن المائي المناخي مع التوازن المائي للموقع (أنظمة التوازن المائي للموقع).

متطلبات الإغلاق
ويهى الإجراءات البالغة لأنها تتعامل مع منطقة المشاكل وحول مسافات النفايات ليبنها تخليد إغلاق.
Co-Disposal (Liquid with Dry waste): The mixing of high moisture content or liquid waste with dry waste. This affects the water balance and is an acceptable practice on a hazardous waste landfill site. This is only acceptable on a general waste landfill site when the liquid is not hazardous and the site is equipped with leachate management measures.

Co-Disposal Ratio: This indicates the volumetric ratio of compacted solid waste to liquid waste. The co-disposal ratio is linked to the Water Balance and is site specific. The co-disposal ratio must be such that no more than 200mm/year of leachate is generated at a given site, there are no free liquid surfaces and the fill is trafficable.

Community: The people living in the vicinity of a proposed, planned or developed activity.

Compaction: The process whereby the volume of waste is reduced, using a purpose built compactor or other suitable machine.

Completion Criteria: A set of criteria relating to the landfill that provide a full description of the condition of the site at completion

Completion: The point at which a landfill has stabilised physically, chemically and biologically to such a degree that the undisturbed contents of the site are unlikely to pose a pollution risk in the landfill’s environmental setting.

Co-Disposal (General with Hazardous Waste): The mixing and joint disposal of Hazardous (H) and General (G) waste in the same landfill. The co-disposal of general waste with hazardous waste as a means of facilitating disposal on a hazardous waste landfill is acceptable, whereas the co-disposal of any significant quantity of hazardous waste with general waste on a general waste landfill is unacceptable.

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Completion: The point at which a landfill has stabilised physically, chemically and biologically to such a degree that the undisturbed contents of the site are unlikely to pose a pollution risk in the landfill’s environmental setting.
Compliance Monitoring: Usually for ground water monitoring, a program that seeks to ensure that the amount of hazardous waste that has leaked into the uppermost aquifer does not exceed acceptable levels.

Composite Liner: An assembled structure of geosynthetic materials and low permeability earth materials (clay or benotinite), placed beneath a landfill to form a barrier against the migration of leachate into the underlying soils and ground water. Compost facilities to monitor the migration of harmful substances from the facilities.

Composting: The controlled biological decomposition of organic solid materials under aerobic conditions.

Conceptual Design: A design that addresses the principles of the intended design, but does not include detailed specifications.

Conceptual Model: An understanding of the landfill (including the design and operational fundamentals) in its environmental setting. The conceptual model must identify the sources, pathways and receptors at a landfill. It represents the understanding of the problem and is used as the basis on which to develop a site-specific risk assessment. The level of detail required of the model will depend upon the complexity of the risk assessment.

Containment Site: One where the bottom and sides are or have been made impermeable to liquids using natural elements or synthetic liner.

Containment: The separation of the waste body and any associated leachate from the underlying soil, rock and water regime, by means of a liner and a leachate collection system.

Contamination: The presence of chemicals in groundwater, watercourses or soils at concentrations that can be measured and are significantly higher than background concentrations (see also Pollution).
Controlled waters: Estuaries and coastal waters up to three nautical miles from the shore, rivers, canals, lakes and groundwaters.

Corrective Action: A program to address the investigation and cleanup of contamination from solid waste facilities and hazardous waste facilities.

Corrosivity Characteristic: The characteristic which identifies wastes that are acidic or alkaline (basic) and can readily corrode or dissolve flesh, metal, or other materials.

Cover Material: Any inert material used to cover waste during landfill; usually applied towards the end of the working day.

Cover: The material used to cover waste. Cover material is usually soil, but may comprise builders’ rubble, ash or other suitable material. Daily cover is usually 150mm thick, intermediate cover is usually 300mm thick and final cover or capping is usually 500mm thick. Final cover may form part of a special capping design and, as is the case with intermediate cover, must be able to support

Critical Factor: A factor which potentially represents a severe constraint on the development or ongoing operation of a landfill. Such factors require further investigation. If a critical factor cannot be satisfactorily addressed, it may become a Fatal Flaw.

Definitive Closure: A new and distinct stage in the regulatory ‘life cycle’ of landfills, subject to formal legal requirements. After definitive closure, waste cannot be deposited in a landfill or closed part of a landfill.

Delisting: The reclassification of a hazardous waste for disposal on a lower class of landfill. This would only be allowed by the Department, based on proof of low mobility or concentration, or proof of successful treatment to render it less hazardous.

Detection Monitoring: This is routine water monitoring carried out bi-annually, using a limited number of indicator parameters, with a view to indicating pollution from the landfill.

**الإجراءات التصحيحية**

هو برنامج يتناول التحقيق في ثم تنظيف أي تلوث من منشآت النفايات، وتلبية ومتطلبات النفايات الحرة.

** الخاصية الكيميائية/ التآكل**

هي الخاصية التي تعرف النفايات الكيميائية أو القلوية (القاعدة)، ويمكن أن تؤدي بسرعة إلى قتل أو تأكل المعدات أو المواد الأخرى.

** المادة التحليلية**

أي لمدة تصل تطبيق لمراقبة النفايات أثناء الدفعة وتوضع عادة في نهاية يوم العمل.

**الغطاء**

هذه المادة المستخدمة لمراقبة النفايات وتكون من النترية إلا أنها قد تشمل الديزل والإزيم أو المواد أو أي مادة أخرى مناسبة. واحدة ما يكون مساحة الغطاء الوسطى في المكعب 50 ملم، أما الطاقة وسادة في يمكن مساحة 200 ملم، أما المادة النظرية أو اللمسية عادة ما يكون مساحة 500 ملم. وقد يمكن أن يكون الغطاء النهائي جزءًا من تصميم غطاء مخصوص في حالة يكون هو الحال بالنسبة للمادة الوسطى ويفات أن يكون قادرًا على عحمل / خذل.

**العامل الحرج**

وهناك عامل يمكن أن يكون في حالة قاسياً وصارمًا على تطوير أو تغيير المبيض. وهو عامل تم تطبيق المشروط حين أنه إذا تم تواصل أي عامل حرج بشكل غير مرضي فقد يصبح عيبًا خطيرًا.

**الإغلاق المؤكد**

هو مرحلة جديدة ومتميزة من دورة الحياة التنظيمية للمدافن و هي خاصة للمدافن القانونية الزرقاء. هذا ولا يمكن إصدار الغطاء في مدى تم إغلاقه مؤكداً أو في جزء منه.

**إسقاط الفيد**

إعادة تصنيف مدافن النفايات الحرة إلى فئة أقل هو أمر لا يمكنه السماح به إلا الإجراء المتعلق به على الأفلاك الحرة / التنقيط أو التقويم أو على دليل على معالجة ناجحة للموقع بحيث يصبح أقل خطورة.

**المراقبة للتثبيت**

هي عملية روتينية لمراقبة المياه أخرى سنويًا باستخدام عدد محسود من الإعدادات المسبقة بغرض تحليل أي تلوث من الماء.
Development Plan: A plan indicating the phasing of the development of a landfill from the landfill preparation, through the operation (which is usually divided into areal phases), to the final closure, rehabilitation and end-use. The phasing, and hence the Development Plan, forms part of the design.

Direct discharge: The introduction into groundwater of any chemical or biodegradable substance without percolation through the ground or subsoil.

Dispersion: Irregular spreading of solutes due to aquifer heterogeneities at pore–grain scale (mechanical dispersion) or at field scale (macroporous dispersion). disposal of hazardous waste. These facilities are the last link in the cradle-to-grave hazardous waste management system.

Disposal Prohibition: The requirement that prohibits the land disposal of hazardous waste that due to physical, chemical and biological activities as it passes through soil and various subsoils.

Duty of Care: This requires that any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, the person retains responsibility for the waste generated or handled.

Earthworks: Engineering work associated with the movement of soils and materials on a landfill.

Effective rainfall: Total rainfall minus actual losses due to evaporation and transpiration. The balance (effective rainfall) may run off and/or percolate into the ground or the waste.

Emission: The direct or indirect release of substances, vibrations, heat or noise from individual or diffuse sources in an installation into the air, water or land.
Encapsulation: The procedure for disposing of hazardous wastes not suitable for direct landfilling. This procedure involves the isolation of the wastes in sealed, reinforced concrete cells or capsules. The capsules are then located in a demarcated area of an **H** class site.

End Tipping: The practice of tipping or pushing waste over the edge of an extended slope and thus extending the landfill laterally. This is unacceptable in most operations, as little or no waste compaction is achieved. The resulting slopes are thus frequently unstable and subject to burning.

End-use Plan: The purpose for which the area of the rehabilitated and closed landfill is used. This may be as a park, playing fields, or other suitable land-use.

End-use Requirements: These are the measures required to upgrade or rehabilitate a landfill site to render it suitable for the proposed end-use.

Engineered Cell: A cell which is designed and engineered to contain hazardous waste. It is underlain by a liner to prevent the waste or the leachate from the waste coming into contact with the environment.

Environment: Environment is defined as i) the natural environment, consisting of air, water, land and all forms of life, ii) the social, political, cultural, economic and working context and other factors that determine people’s place in and influence on the environment, and iii) natural and constructed spatial surroundings.

Environmental assessment level (EAL): A non-statutory benchmark of concentration for a substance after dispersion into the receiving environment, set at a level below which no harm is likely.

Environmental Impact Assessment (EIA): An investigation to determine the potential detrimental or beneficial impact on the surrounding communities, **fauna, flora**, water, soil and air, arising from the development or presence of a landfill.

**التغليف**

هو الإجراء المستخدم للمخلص من النفايات الخطرة التي لا تناسب معها التغليف البني. وهو إجراء يطبق على عزل النفايات في خلايا خرسانية مصنوعة أو حافلات توضع بعد ذلك في منطقة مرتبطة عبارة عن موقع فئة **H**.

**القلب**

وهى خمسة تقديرات أو دفع النفايات من فوق حافة منحدر ممتدة بما يعين المدى الجانبي للمنزل، وهو أمر غريب لغرض التشغيل إذا لم يتم إتلاف النفايات أو لا تحقق النتاوة كتيرة ما تكون غير مستقرة وعرضة للإحتراق.

**خطة الاستخدام النهائي**

هو العرض الذي يستخدم لأجل منطقة المنف الحاصل بعد إعادة تأهيله وقد يكون وفقاً على بعض النفايات أو غيرها من الاستخدامات المناسبة.

**متطلبات الاستخدام النهائي**

وهى الإجراءات المطلوبة للتسرير أو إعادة تأهيل موقع المنف بنحو يصبح مناسبًا للإستخدام النهائي المفترض.

**الخليفة المهندسة أو المؤمنة**

وهي خليفة مصممة ومهددة لاحتواء النفايات الخطرة ويعق أسفلها مبطن مناسب لمنع النفايات أو الرشيح الناتج عنها من الإتصال بالبيئة.

**المستوى التقييمي البيئي (E.A.L)**

هو المعيار البيئي غير السريني لتحديد مستوى ما بعد تأهيله في البيئة المستقبلة والذي تم ضبطه على مستوى لا يكون بالضرر تحت شروط

**تقييم الأثر البيئي (EIA)**

هو خطيء لتحديد الأثر المحتمل سواء الساقع أو البناء على المجتمعات الحيوانية والنباتية والرياح والرياح والرياح نية تطور أو لم تعد ملائمًا.
Environmental Impact Control Report (EICR): A report which details how any detrimental impacts, identified in the Environmental Impact Assessment, can be prevented or ameliorated by means of landfill site design and operation.

Evapotranspiration: The combined effects of evaporation and transpiration.

Fatal Flaw: A factor or situation which prevents the development of an environmentally acceptable waste disposal facility, except at prohibitive cost.

Flag: A symbol which draws attention to an aspect of investigation, design or operation that requires special attention by a recognised expert.

Flexible Membrane Liner (FML): (see Geomembranes).

Flood plain A region of land around a body of water, usually a river or stream, that is flooded on a regular basis, usually annually.

General Waste: Waste that does not pose an immediate threat to man or the environment, i.e. household waste, builders' rubble, garden waste, and certain dry industrial and commercial waste. It may, however, with decomposition, infiltration and percolation, produce leachate with an unacceptable pollution potential (see Waste).

Generation rate: The amount of waste that is produced over a given amount of time. For example, a district may have a generation rate of 100 tons per day.

Geocomposite Membrane: Manufactured, assembled material using at least one geosynthetic product among the components.
Geomembranes: Very low permeability synthetic membrane liners and barriers used with any geotechnical engineering-related material so as to control fluid migrations in a man-made project, structure or system. Synthetic membranes include flexible membrane liners (FMLs).

Geonet: A synthetic liner component that facilitates drainage. A geonet is analogous to the sand component in natural liners.

Geosynthetic Clay Liner (GCL): A manufactured composite barrier system comprising of layers of clay materials (e.g. bentonite) and geosynthetic materials (e.g. geotextiles and/or geomembranes) to form a single sheet for use as a liner.

Geotextile: A permeable, polymeric, woven, non-woven or knitted material used in geotechnical and civil engineering applications. A cloth or felt made of natural or synthetic fibres and designed to act as a drainage or filtration element.

G-Landfill: A landfill designed to accept only general waste. Depending on the Site Water Balance, it may or may not have a leachate management system.

Ground Water: Water occupying pores in the soil and cavities and spaces in rocks in the saturated zone of the profile. This water may rise from a deep, magmatic source or be due to the infiltration of rainfall (recharge).

Groundwater monitoring well: A well placed at an appropriate location and depth for taking water samples to determine groundwater quality in the area surrounding a landfill or other site.

Guideline: While not requirements, guidelines are recommended actions which represent good practice. They are not enforceable, but may form the basis for site specific permit conditions in which case they become mandatory. [Handling, Classification and Disposal of Hazardous Waste, Pretoria, 1993].
Harm: The damage to a receptor that results when a hazard is realised. Harm to the health of living organisms or other interference with the ecological systems of which they form a part and in the case of man, includes offence to any of his senses or harm to his property.

Has not been adequately treated to reduce the threat posed by such waste.

Hazard Ranking System: A model that determines the relative risk to public health and the environment posed by hazardous substances in ground water, surface water, air, and soil.

Hazard Rating: A system for classifying and ranking hazardous wastes according to how great a hazard they present. This is based on Mammalian Acute and Chronic Toxicity, Ecotoxicity and Environmental Fate. Based on this, Hazardous Waste is classified into: Hazard Rating 1: Extreme Hazard; Hazard Rating 2: High Hazard; Hazard Rating 3: Moderate Hazard; and Hazard Rating 4: Low Hazard. [Ref. Department of Water Affairs and Forestry: Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste, Pretoria, 1993].

Hazard: A property or situation that in particular circumstances could lead to harm.

Hazardous Constituents: those constituents that have been detected in the uppermost aquifer and are reasonably expected to be in or derived from the waste contained in the unit.

Hazardous Waste: Waste, other than radioactive waste, which is legally defined as hazardous in the state in which it is generated, transported or disposed of. The definition is based on the chemical reactivity or toxic, explosive, corrosive or other characteristics which cause, or are likely to cause, danger to health or to the environment, whether alone or when in contact with other waste. After UNEP definition (see Waste).
Hazardous Waste (Alternative Definition): Waste that may, by circumstances of use, quantity, concentration or inherent physical, chemical, or infectious characteristics, cause ill-health or increase mortality in humans, fauna and flora, or adversely affect the environment when improperly treated, stored, transported or disposed of (see Waste).

Hazardous Waste Landfill: A containment landfill, designed specifically for the disposal or co-disposal of hazardous waste.

Head (hydraulic head): The sum of the elevation head, the pressure head and the velocity head at a given point in a water system. In practical terms, this is the height of the surface of a column of water above a specified datum elevation.

Heavy metals: Elemental metals having a high relative density and properties that may be hazardous in the environment. The term usually includes the metals copper, nickel, zinc, chromium, cadmium, mercury, lead, arsenic, and may include selenium and others.

HELP: (hydrologic evaluation of landfill performance) Model: A specialized computer program that performs the water balance equation and aids in modeling by predicting leachate generation. By selecting different covers and liners, an optimum combination can be achieved.

Hydraulic conductivity: The coefficient of permeability describing the rate at which water can move through a permeable medium.

Hydraulic gradient: The change in total head with a change in distance in a given direction. The direction is that which yields a maximum rate of decrease in head.

Hydrogeology: The study of groundwater movement and chemistry, etc.
Indirect discharge: the introduction into groundwater of any hazardous substance after percolation through the ground or subsoil.

Infiltration layer: A low hydraulic conductivity layer in a landfill, usually a component in the cover, that is placed to minimize liquid infiltration to the waste layers.

Initial Rate of Deposition (IRD): The initial waste stream or deposition rate for a landfill site, expressed in T/day, for a 260 day year (see Maximum Rate of Deposition).

Inorganic waste: Waste composed of matter other than plant or animal (i.e., contains no carbon).

Integrated Environmental Management (IEM): A management approach designed to ensure that the environmental consequences of development proposals are understood and adequately considered in the planning process.

Interested and Affected Parties (IAPs): Interested and Affected Parties are those people who will be affected in some way by the development of the proposed landfill. They may be represented by adjacent residents or farmers, a residential community, the public at large or local, provincial and national government forums.

Investigative Monitoring: Investigative water quality monitoring is monitoring which uses an extended range of parameters in order to investigate any leachate pollution identified by Detection Monitoring.

Lagoon: A lagoon is a lined dam constructed to contain liquid waste.

Lagooning: A technique for settling out fine solids by forming a settling pond with a long residence time, usually days or weeks.
Land Disposal: is the placement in or on the land, except in a corrective action unit of hazardous waste, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

Landfill (n): The waste body created by landfilling. This may be above or below grade, or both.

Landfill (v): To dispose of waste on land, whether by use of waste to fill in excavations or by creation of a landfill above grade, where the term ‘fill’ is used in the engineering sense.

Landfill Development Process: This is the development of a landfill from its inception or siting, through its investigation, design, permitting, preparation, commissioning, operation, closure and enduse. Monitoring takes place throughout the above process and may continue for up to 30 years after closure.

Landfill: gas Generated under anaerobic conditions and is a mixture of methane (CH4) and carbon dioxide (CO2) approximately 60:40 by volume.

Landfill Operation Monitoring: The auditing and assessing of a waste disposal operation to determine whether it conforms to the site design and to the Minimum Requirements.

Leachate collection system: A network of pipes or geotextiles/geonets placed at low areas of the landfill liner to collect leachate from a landfill for storage and treatment. Flow of leachate along the liner is facilitated by the use of a soil drainage blanket or geonet.

Leachate Detection System: A system for detecting leachate at B- landfills. It comprises rudimentary liners, sloped towards ‘finger drains’ at the lowest point of the landfill.

Leachate: Liquid drainage from a landfill site containing dissolved solids and products of decomposition of organic matter.

التعاليم البري"}

Landfills Glossary

التخلص البري

Land Disposal: is the placement in or on the land, except in a corrective action unit of hazardous waste, and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault, or bunker intended for disposal purposes.

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BCRC-Cairo
Leachate Management: The collection and drainage of leachate to a point where it can be extracted for treatment. This requires a system of under-drains and liners and, in certain instances, is synonymous with containment.

Leachate recycling: Pumping of leachate from a collecting sump back over the surface of the waste and letting it run into the waste in order to accelerate decomposition both of the waste and organic compounds in the leachate.

Leachate: An aqueous solution with a high pollution potential, arising when water is permitted to percolate through decomposing waste. It contains final and intermediate products of decomposition, various solutes and waste residues. It may also contain carcinogens and/or pathogens. (Sporadic/Significant)

Lift: A series of adjoining cells of the same height, and at the same level, in a landfill.

Liner: A layer of low permeability material placed beneath a landfill and designed to direct leachate to a collection drain or sump, or to contain leachate. It may comprise natural materials, synthetic materials, or a combination thereof (see also FML and Geomembranes).

Listed Wastes: Wastes that are considered hazardous under national by laws, because they meet specific listing descriptions.

Maximum Contaminant Levels Are the maximum levels of hazardous waste or hazardous constituents allowed to be present in the groundwater.

Maximum Rate of Deposition (MRD): The projected maximum rate of waste deposition during the expected life of a landfill, expressed in T/day, for a 260 day year (see Initial Rate of Deposition).

MCCSSO: A standard system of soil profiling, which describes the soil in terms of Moisture, Colour, Consistency, Structure, Soil type and Origin.
Medical Waste: Culture and stocks of infectious agents, human pathological wastes, human blood and blood products, used sharps, certain animal wastes, certain isolation wastes, and unused sharps.

Minimum Requirement: A standard by means of which environmentally acceptable waste disposal practices can be distinguished from environmentally unacceptable waste disposal practices.

Mitigate: To reduce an impact to meet the objectives of a Minimum Requirement.

Mixed Waste: Those include hazardous waste, municipal waste, liquid waste, and solid waste. They also include radioactive waste that is also a hazardous waste.

Moisture content: The fraction or percentage of a substance or soil that is water.

Monitoring Committee: A committee comprising the Permit Holder or his or her authorized representatives (Responsible Person), the Department and IAPs. The function of the Monitoring Committee is to monitor the operation of the landfill and to disseminate information to relevant people e.g. the public.

Monitoring well: A well that is used to detect items such as gas concentrations, water contamination, and leachate concentration. Wells are usually placed in and around landfills.

Monitoring: A continuous or regular periodic check to determine the ongoing nature of a potential hazard, conditions along environmental pathways and the environmental impacts of landfill operations to ensure the landfill is performing according to design. The general definition of monitoring includes measurements undertaken for compliance purposes and those undertaken to assess landfill performance.

Mono-landfill: A landfill that accommodates one type of waste.
Municipal solid waste (MSW): MSW means household waste, commercial solid waste, nonhazardous sludge, conditionally exempt small quantity hazardous waste, and industrial solid waste. It is also includes durable goods (e.g., appliances, tires, batteries), nondurable goods (e.g., newspapers, books, magazines), containers and packaging, food wastes, yard trimmings, and miscellaneous organic wastes from residential, commercial, and industrial nonprocess sources.

Municipal Solid Waste Landfill: A discrete area of land or excavation that receives municipal solid waste

Municipal Waste: Wastes collected by municipalities or by their order, including wastes from households (not household hazardous wastes) and similar wastes from commercial activities, office buildings, institutions and industry that dispose of waste at municipal facilities.

Operating Plan: A site-specific document which describes the way in which the landfill is operated. The Operating Plan commences at the level and detail of daily cell construction and continues through to the development and excavation sequence, access and drainage within a given phase of the Development Plan.

Operating Requirements: Parameters established by a facility and written into a permit that will ensure a combustion unit meets numerical performance standards.

Outflow Rate: The rate at which leachate will pass through a liner, taking account of the head of leachate likely to accumulate over the liner. Outflow rate is measured in m^3/year, m^2/year or m/year.

Overlay maps: A series of individual maps, each of which shows specific data. The maps are placed on top of one another to form a composite map showing all the data.
**Permeability (Primary):** The rate per unit area at which fluid will pass through a porous material under a unit flow gradient. The constant of proportionality \( K \) in Darcy's Law is the permeability and is measured in m/year or cm/sec, which is synonymous to hydraulic conductivity.

**Permeability (Secondary):** The rate per unit area at which fluid will pass through macro features of a soil such as paleo-root canals, termite tunnels and rodent burrows, under unit flow gradient.

**Permeability:** A measure of how well a liquid moves through the pores of a solid. Expressed as a number applied to landfills in terms of how quickly water moves through soil; it is typically expressed as centimeters per second.

**Permit Holder:** The person who, having obtained a Permit to operate a waste disposal site, and is legally responsible for the site, both during operation and after closure.

**Permit Procedure:** The procedure to be followed and the necessary investigations to provide the Department with the necessary information so that a Permit can be issued.

**Permit:** The Permit issued by the Department for the operation or closure of a landfill.

**Permitted Facilities:** Facilities that have obtained a permit from local agency to engage in the treatment, storage, or disposal of hazardous waste.

**Phreatic Surface:** A surface defined by the levels at which the ground water will come to rest in a series of boresholes drilled in an area. The surface indicates the levels at which the pressure in the ground water is atmospheric.

**Pollutants or Contaminants:** Any element, substance, compound, or mixture that, after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any organism, will or may reasonably be anticipated to cause illness, death, or deformation in any organism. The definition of pollutant or contaminant specifically excludes petroleum and natural gas.
Pollution: Emissions as a result of human activity which may be harmful to human health or the quality of the environment, cause offence to any human senses, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment.

Pore water: Water that is contained within the pore spaces of a soil or rock.

Post-closure care: A procedure of maintaining the environmental controls and appearance of a landfill after it has ceased to accept waste.

Post-closure management: Works done to maintain pollution control systems and monitor their effectiveness. This period, which follows cessation of landfilling, ends when the permit / waste management license is surrendered.

Post-Closure: Period after closure during which owners and operators of solid or hazardous waste disposal units conduct monitoring and maintenance activities in order to preserve the integrity of the disposal system.

Precautionary Principle: Where a risk is unknown; the assumption of the worst case situation and making provision for such a situation.

Pre-disposal Background: This is water quality monitoring which takes place before a landfill is commissioned and thus reflects the pollution status of the water regime prior to waste disposal. This monitoring includes upstream and downstream surface water, as well as upgradient and down gradient ground water. It may be used as a datum against which to compare all future water quality.

Primary leachate: When waste enters a landfill, it contains some amount of liquid, which leaches out of the refuse as primary leachate.

Putrescible: A substance capable of being readily decomposed by bacterial action. Offensive odours usually occur as by-products of the decomposition.
Ramp Method: The practice of working waste up a 1 in 3 slope in thin layers not exceeding 0.5m in thickness. This is consistent with sanitary landfilling, using cells. Maximum compaction is achieved by passing over the waste at least five times with a purpose built landfill compactor.

Receptor: The entity (e.g. human, water body, ecosystem, building, etc.) that is sensitive or vulnerable to the adverse effects of the hazardous substance or material.

Recycling: The separation and collection of wastes, their subsequent transformation or remanufacture into usable or marketable products or materials, and

Rehabilitation: The restoration of a landfill site to a state which is publicly and environmentally acceptable, and which is suitable for the implementation of the agreed End-use Plan.

Remediation: The rectification of problems, caused by bad practices, through the implementation of remedial measures.

Response Action Plan: A plan intended to counter or minimise the adverse effects of any malfunction of a landfill design element with immediate effect. A Response Action Plan is usually associated with the disposal of Hazardous waste.

Responsible Person: The Permit Holder or his legally appointed representative who takes responsibility for ensuring that all or some of the facets of any of the following are properly directed, guided and executed, in a professionally justifiable manner: investigatory work, design, preparation, operation, closure and monitoring.

Restoration: The process that will return a site to a condition suitable for its proposed after-use. Includes design, initial landscaping works, soil spreading and aftercare.
Risk Assessment: The identification of possible impacts of a landfill on the environment so that they can be addressed in the design.

Risk assessment: The process of identifying and quantifying a risk and assessing the significance of that risk in relation to other risks.

Risk Screening: Sometimes referred to as Tier 1, it is the first level of risk assessment and involves the initial consideration of the risks from the landfill. Risk screening is used to determine whether the landfill represents, or potentially represents, a risk to receptors.

Risk: The probability of dangerous substances contained in the waste, leached therefrom, or released by emission, entering into the air, the surface environment or the water regime in unacceptable quantities or concentrations. The consequences of such occurrences could be manifested as a threat to public health or as the impairment of an eco-system or resource.

Sanitary Landfilling: A method of disposing of waste on land without causing nuisances or hazards to public health or safety. Sanitary landfilling uses the principles of engineering to confine the waste to the smallest practical area, to reduce it to the smallest practical volume, and to cover it with a layer of earth at the conclusion of each day's operations or at such less frequent intervals as may be acceptable.

Saturated Zone: The portion of the soil or rock profile situated below the phreatic surface. In this zone, the soil pores are filled with water, as opposed to those in the unsaturated zone, where the pores are filled with gas and water (see unsaturated zone).

Scavenging: At a landfill or material recovery facility, scavenging is the uncontrolled separation of recyclable and reusable materials. Uncontrolled means that the operator does not monitor the removal of materials, and in many cases prohibits it. Material scavenging of recyclables may also occur at the curb or at drop-off centers.
Secondary leachate: When water percolates through a landfill, the water becomes contaminated and becomes leachate. This leachate is known as secondary leachate.

Settlement: The amount by which a landfill surface sinks below its original level due to compaction by its own weight and degradation of the waste. For example, a tipped waste thickness of 40 metres settling by 8 metres would have undergone 20% settlement. (This example is for finished surface levels only and does not consider the age or rate of degradation and settlement).

Shear Strength: The shear strength of a soil (or waste) is the sum of the frictional resistance between the soil grains (or particles of waste) and the cohesion imparted by the finer fractions (clay and silty)

Shredder: A mechanical device used to break waste materials into smaller pieces by tearing and impact action. Shredding solid waste is done to minimize its volume or make it more readily combustible.

Significant Leachate Generation: Seasonal or continuous leachate generation resulting mainly from climate and/or waste moisture content. In the case of existing landfills, significant leachate generation may also result from poor site selection and/or design. It is essential that significant leachate generation be managed by means of leachate collection and treatment if water pollution is to be

Significant: Factors or considerations are termed significant when they are important, because they are of consequence. For example, they will have a detectable influence on a process, the environment, or the end result.

Site Report: the site report shall describe the condition of the site of the installation and shall, in particular, identify any substance in, on or under the land, which may constitute a pollution risk.

Site Specific Factors: Factors peculiar to a specific site that must be taken into consideration when applying the Minimum

المترشح الثانوي

الهبوط

قوة القص

المشتر

التود مؤثر للرشيح

مؤثر

تقرير الموقع

عوامل خاصة بالموقع تحديدًا
Requirements.

Site Water Balance: The water balance of the landfill. The site water balance will be affected by ambient climatic conditions and by site specific factors such as the moisture content of incoming waste, landfill siting and site drainage (see Water Balance).

Sludge: A semi-liquid residue remaining from the treatment of municipal and industrial water and wastewater.

Solid Waste: Any garbage, refuse, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material, resulting from industrial, commercial, mining, and agricultural operations and from community activities. For the purposes of hazardous waste regulation, a solid waste is a material that is discarded by being either abandoned or recycled.

Source: The hazardous substance or material. The ‘source’ for waste management facilities is defined by the hazardous properties of the waste types and operations to which they will be subjected on the proposed site.

Special waste: Refers to items that require special or separate handling, such as household hazardous wastes, bulky wastes, tires, and used oil.

Sporadic Leachate Generation: Leachate generation resulting from abnormal circumstances, e.g. excessively wet periods, the temporary deposition of wet or saturated waste, or poor site drainage (where this can be remedied). Sporadic leachate generation is not considered to warrant the provision of a leachate management system.
Stabilization: As applied to landfill, this term includes the degradation of organic matter to stable products, and the settlement of the fill to its rest level. The process can take many years to complete. The term also refers to the use of plants and/or geotextiles to prevent soil erosion from the surface of a landfill or spoil heap.

Standard: A measure by which the accuracy of quality of others or degree of excellence is judged, or a model for imitation. (Not used in legal sense) storage, or disposal of hazardous waste.

Surcharge (landfill): To fill a landfill above final contours to allow for subsequent settlement. For example, if 20 per cent settlement is predicted and a 100-metre finished waste thickness is required, then a surcharge of 25 metres of waste is required, i.e. the total placed waste thickness would be 125 metres.

Surface Water: Water (usually rainfall) which flows across the ground surface towards and in man made and natural drainage features such as drains, rivers, streams, lakes and ponds.

Sustainability (landfill): Returning the contents of a landfill site to the environment in a controlled manner. Done at a rate which the environment can accept without harm, generally using pro-active measures over a limited timescale to diminish polluting capability, and in a way which does not leave a long-term legacy of active monitoring and management.

Synthetic liner: A type of liner consisting of a plastic membrane, instead of soil. Synthetic liners are less permeable, thinner, and more flexible than soil liners.

Technical Design: The Technical Design is based on the Conceptual Design. It includes detailed specifications of materials, measurements and procedures, as well as detailed drawings. the purchase of materials made from recyclable materials. This is applicable specifically to construction activities and is an essential tool for the assurance of quality in landfill development. CQA should be certified by an independent technical consultant.
Quality engineer. CQA is required to ensure that the objective of producing a high quality, practically flaw-free liner is achieved, as even small variations in material and physical characteristics could prejudice the integrity of the liner and hence the design specification would not be met.

Treatment, Storage, and Disposal Facilities: Facilities engaged in the treatment, storage, or disposal of waste are called treatment, storage, and disposal facilities. These facilities are designed to ensure that the waste is properly treated, stored, and disposed of in a manner that minimizes the potential for contamination of the environment.

Unsaturated Zone: The unsaturated zone, also referred to as the vadose zone, is the portion of the soil or rock profile situated above the phreatic surface. In this zone, the soil pores are filled with gas and water, as opposed to those in the saturated zone, where pores are filled with water (see saturated zone).

Unsaturated zone: The zone of a stratum lying above a water table in which the pore space in the soil is not saturated with water.

Vadose zone: The zone between the land surface and the water table. Vegetation.

Waste Analysis Plan: A plan that outlines the procedures necessary to ensure proper treatment.

Waste Body: This refers to the body of waste (and cover) that is contained in the landfill. Because it is subject to decomposition, it has the potential to generate leachate and must therefore be adequately separated from the water regime.

Waste Disposal (v): The act of disposing of waste. In the context of this document, only waste disposal on land is addressed.

Waste Disposal Site: In the context of this document, a waste disposal site is referred to as a landfill, because the vast majority of all waste is ultimately disposed of on land, whether it be in trenches or other excavations, or above grade.

Waste Load Allocations: This term refers to volumes of hazardous waste permitted on certain landfills. Such allocations are calculated taking both the nature of the waste and the design specification into account.
specific site characteristics into account.

**Waste Minimization:** The reduction, to the extent feasible, in the amount of hazardous waste generated prior to any treatment, storage, or disposal of the waste. Because waste minimization efforts eliminate waste before it is generated, disposal costs may be reduced, and the impact on the environment may be lessened.

**Waste Pile:** An open pile used for treating or storing nonliquid hazardous waste.

**Waste stream:** A term describing the total flow of solid waste from homes, businesses, institutions and manufacturing plants that must be recycled, burned, or disposed of in landfills; or any segment thereof, such as the “residential waste stream” or the “recyclable waste stream.”

**Waste:** An undesirable or superfluous by-product, emission, or residue of any process or activity which has been discarded, accumulated or stored for the purpose of discarding or processing. It may be gaseous, liquid or solid or any combination thereof and may originate from a residential, commercial or industrial area. This definition excludes industrial waste water, sewage, radioactive substances, mining, metallurgical and power generation waste. (See General Waste and Hazardous Waste).

**Water balance:** An equation that is used to model and predict the amounts of water that will go to various destinations. Typical destinations include evaporation, infiltration, and run-off. The sum of the amounts to the destinations must be equal to the source of the water (usually precipitation).

**Water Balance:** In the context of this document, the term Water Balance refers specifically to the water balance within the landfill system, i.e. total inputs equal the total outputs plus the moisture stored in the landfill. Inputs may include precipitation, moisture inherent in incoming waste, run-off, surface water and ground water. Outputs may include evaporation, transpiration and leachate. Water may also be stored within the landfill and augmented by water generated from biochemical reactions. All these factors would have to be taken into account in a classical Volumetric Water Balance Calculation (see

**Waste Minimization:** تقليل النفايات إلى الحد الأدنى

*معنى النفايات* 
وبين الخضفع لأقصى درجة ممكنة من كم النفايات الحضرية المدفونة قبيل المعالجة أو التخلص، وتقوية جهد الخضوع من النفايات الحضرية إلى الحد الأدنى إلى تقليص كلافية التخلص وتقليل الآثار السلبية على البيئة.

**Waste Pile:** كومة النفايات

*معنى النفايات* 
وهي كومة مكشوفة تستخدم المعالجة وتخلص النفايات الحضرية غير السائدة.

**Waste stream:** مجرى النفايات

*معنى النفايات* 
ويكفي هذا المصطلح الدفعة الكلية للنفايات الصناعية من المنازل والشركات والمؤسسات والصناع وقد يكون إعادة تدويرها أو حرقها أو التخلص منها في مانع أو أي جزء منها مثل النفايات السكنية أو مجرى النفايات القادمة لإعادة التدوير.

**Waste:** النفايات

*معنى النفايات* 
هي منتجات ثانوية/حاجية غير مرغوبة أو زائدة عن الحاجة أو إيجابيات أو خلفيات أية عملية أو نشاط نبات أو تراكب أو خروج بخصوص المعالجة أو الإفراط.

*معنى النفايات* 
وقد تكون النفايات غازية أو سائلة أو صلبة أو مزيج منها وقد تنشأ عن منطقة سكنية أو إدارية أو صناعية.

*معنى النفايات* 
وسيستقبل هذا التعريف مياه الصرف الصحي والصرف الصحي والمواد المشعة والصوامع الأخرى في جذب النفايات الناتجة عن توليد الطاقة (أو أثر النفايات العامة والمختارة). (انظر النفايات التالية الناتجة من توليد الطاقة، ويعتبر النفايات العامة والمختارة النفايات العامة والمختارة.)

**Water balance:** الالتوازن المائي

*معنى التوازن المائي* 
هي معايير تستخدم لقياس تدفق الماء الذي يذهب إلى الوجهات المتصلة. وتشمل الوجهات：الحرق والترشح والمشكلة (Run- off) والمواد السطحية والمياه الجوفية. ولا ي должен احتضان جميع المقدار الخاص بالوجهات السطحية الذكر مشترط الماء (وهو المطر).

**التوازن المائي (تعريف آخر)** 
يشير مصطلح التوازن المائي في سياق هذه الوثيقة تدفقاً إلى التوازن المائي بداخل نظام مرافق النفايات، مثل أن النفايات الكلية تسبح على سطح النفايات، وتضمن المناحل المطرانية والترشح والمياه الجوفية والمياه السطحية وطبقة النفايات. ويتطلب التوازن المائي توجيه النفايات السائلة إلى موانئ التخلص، وإدارة النفايات بطرق صحية وآمنة.

**التوازن المائي** (نافذة أخرى)

*معنى التوازن المائي* 
تشير مصطلح النفايات المائي في هذا السياق إلى التوازن المائي الذي ينتج عن ضمان أن كلاً من النفايات السائلة والجافة وسجادة النفايات تدفقاً إلى موانئ التخلص، وإدارة النفايات بطرق صحية وآمنة.
Climatic Water Balance and Site Water Balance).

**Water table:** The level below the earth’s surface at which the ground becomes saturated with water. Landfills and composting facilities are designed with respect to the water table in order to minimize potential contamination.

**Water table:** The planar surface between the saturation and aeration zones, on which water is at exactly atmospheric pressure. When assessing whether a discharge is direct or indirect, a representative winter water table level based on hydrogeological records should be employed and/or expert opinion.

**White goods:** Large household appliances such as refrigerators, stoves, air conditioners, and washing machines.

**Working face:** The area of the landfill that is currently being filled with refuse. The refuse is typically placed in cells. The open face where refuse is being unloaded and compacted is the working face.

**Working Face:** The active part of the landfill; where waste is deposited by incoming vehicles, then spread and compacted on the sloped face of the cell by a compactor.

**المنسوب المائي**
المستوى الذي تتشبع عنه الأرض مائيًا تحت السطح. وتشتمل موانع النفايات ومصطلحات التسمية بالنسبة للمنسوب المائي وذلك لتقليل من الشروط المحيطة إلى الحد الأدنى.

**المنسوب المائي**
هو سطح المستوى بين مناطق التشبع والتهوية حيث يعدل ضغط الماء الضغط الجوي بالضغط عند تقييم ما إذا كان الطرد مباشرةً أو غير مباشر يجب إستعمال مستوى مثالي للمنسوب المائي الشتوي بناءً على السجلات الهيدروجيولوجية وأو آراء الخبراء.

**السلع البيضاء**
وتشمل الأجهزة المنزلية الكبيرة كالثلاجات والمواد والмяكينات والغسالات.

**سطح وجه التشغيل**
هي المنطقة التي يتم فيها النفايات حاليًا في المكان حيث توضع النفايات عادة في خلايا. أما السطح وجه الكشف حيث يتم إفراغ وإدمان النفايات فهو سطح وجه التشغيل.

**سطح وجه التشغيل**
هو الجزء الشLiquid من المكان حيث يتم إدخال النفايات بواسطة المركبات الواردة ثم تنشر وندمج على السطح المتحدر للخلية بواسطة ماكينة إدمان (Compactor).