

Workgroup Waste Processing Aruba 2017-2018

Final Report Integrated Solid Waste Management Aruba

Short term solid waste management strategies in order to address the most urgent waste management challenges at the Serlimar landfill at Parkietenbos in line with a long-term vision

January 2018

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Abstract

This report is made within a short deadline on behalf of the Minister of Spatial Development, Infrastructure and Environment (the Minister). This report is a result of the consultations and meetings held by the Workgroup installed by the Minister to advise on the urgent challenges regarding waste management on Parkietenbos. The landfill at Parkietenbos cannot be closed at once; at its most, the major waste streams could be redirected. During the mid-term and long-term approach, the other waste streams are addressed. For the long-term solution, the Workgroup recommends to outsource this with two Requests for Information (RFI), one for the integrated waste management facility (separation and thermal) and one for the remediation of the landfill Parkietenbos. The Workgroup furthermore advises on a National Awareness Campaign, revision and complementing the prevailing laws, enforcement of the laws and strengthening Serlimar.

Expressing our gratitude to all Workgroup members who have fully committed themselves.

1. Introduction

For decades, Aruba has been struggling with waste problems such as illegal dumping, uncontrolled landfilling, burning of waste in the open air, littering, lack of environmental legislation, lack of financial resources and inefficient waste handling systems. The majority of the waste streams are being disposed at the landfill at Parkietenbos, which is managed by Serlimar. The biggest challenge for a small island like Aruba is the lack of space for new landfill areas or to extend the current landfill. The current situation is causing different nuisance for the residents in the neighborhood, the environment and the workers. The nuisances caused are in the form of odor, smoke, pests (e.g. flies), litter to the sea, and risk of contamination of the surrounding environment. The risks involving contamination of the environment are by air and by water. In 2002, a new area next to the old landfill at Parkietenbos was built as landfill. This new landfill was supposed to be a temporary solution until a modern and more efficient processing method was in place. The new processing method was built and started operating in 2009. The government in 2009 discontinued the operations of this new plant, due to change of government. Since then, no new processing method of waste was used and the majority of the waste streams kept going to the landfill at Parkietenbos. Therefore, the capacity of the landfill at Parkietenbos exceeded its limit and is causing great risks for the environment and the health of the workers and the community.

In other areas on Aruba, sand and stones are being exploited for the construction industry. This has as consequence that quarries are left behind by the owners with no destination. Others are being used by the owners or by people for illegal dumping, which is forbidden. Due to lack of enforcement, these areas were left without control and supervision.

In 2018, the Government of Aruba has as priority to modernize and make the waste processing of Aruba a more environmental friendly structure. The restoration of the quarries has also the attention of the Government of Aruba. Because of the urgency, the risks and the threads of the waste problems of Aruba, the Minister of Spatial Development, Infrastructure and Environment installed a Workgroup Waste Processing (the Workgroup; "Werkgroep Afvalverwerking") to advise him on the various waste problems that Aruba has.

The Workgroup consists of different stakeholders involved in the Waste Management field. A stakeholders meeting will be held by TNO (which has a yearly agreement with the Government of Aruba) to incorporate their input in the decision making process of the Government. The Workgroup has been divided in several subgroups. This because the issues discussed are various and need different qualification and expertise to discuss and approach the different challenges. The plenary group has summarized the results of each subgroup in this report.

This report is the result of the task given by the Minister of Spatial Development, Infrastructure and Environment to the Workgroup. This report is a compilation and an overview of the different tasks given to the Workgroup. Many of the tasks relate with each other. This report integrates the solid waste challenges into one document.

1.1 Installation of the Workgroup by the Minister

The Minister of Spatial Development, Infrastructure and Environment has decided to install a Workgroup Waste Processing on December 21, 2017. This Workgroup has different task described in a Ministerial Decree (Annex 1). This Workgroup consists of different stakeholders of the Aruban Community, which are:

- a. The Department of Nature and Environment (DNM),
- b. Department of Public Works (DOW),

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- c. Department of Public Health (DVG),
- d. Department of Infrastructure and Planning (DIP),
- e. Department of Legislation and Legal Affairs (DWJZ),
- f. Serlimar (Government Waste Management Company),
- g. ATIA (Aruba Trade and Industry Association),
- h. Stichting Parkietenbos (Foundation of residents near the landfill Parkietenbos),
- i. STA (Sindicato di Trahadornan Arubano, Union),
- j. SEPPA (Sindicato di Empleadonan Publico y Privado di Aruba, Union), and
- k. WEB N.V. (Water and Electricity Company).

1.2 Scope and definitions

The scope of work is to advise the Minister of Spatial Development, Infrastructure and Environment for an integrated approach to solve the waste management problems on an environmental friendly and efficient way. The Workgroup got the assignment to formulate the best possible advice within 45 days since December 11, 2017, for the Minister of Spatial Development, Infrastructure and Environment. The advice should be phased in 3 periods, short-, mid-, and long-term solutions.

1.2.1 Scope of Work

The Workgroup has been installed by a Ministerial Decree. The Workgroup has 45 days to come with a report directed to the Minister of Spatial Development, Infrastructure and Environment.

The report should consist of the following:

- a. A direction to an integral, environmental friendly and efficient way of solid waste management;
- b. Report on the solid waste stream and composition of the solid waste;
- c. Report on the different quarries and illegal dumping sites;
- d. Description of the current legal solid waste management framework, enforcement and supervision of the quarries and illegal dumping sites;
- e. Description of the available legal instruments;
- f. Description of the required new legislation or adaptation of the current legislation;
- g. Mapping of the short-term solutions;
- h. Update the report "Cero Tolerancia" of 2012;
- i. Advice on strengthening Serlimar SG.

1.2.2 Short-term

The short-term period consists of 90 days. It is the intention of the Minister of Spatial Development, Infrastructure and Environment to have the landfill at Parkietenbos closed within 90 days. It is the task of the Workgroup to research the possibilities of closing the landfill and provide a sound advice in this respect.

1.2.3 Mid-term

The mid-term solution refers to a period of 2 to 2.5 years, where it is the intention to have a temporary waste management solution during this period while preparations are made for the long-term solution.

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1.2.4 Long term

Long-term: this period is when the long-term solutions for waste processing are in place. The long-term solution refers to a long lasting (sustainable) and complete waste management solution for the Island of Aruba

1.2.5 Bottom lines

Guiding principles of this report are the environmental and human factors that should be taken into account for any solutions for the waste management problems of Aruba. The Workgroup considers the following bottom lines:

- The problem may not be relocated.
- The workers and local citizen have to be considered, their health risk has to be reduced or eliminated.
- All stakeholders have to be aligned.
- The polluter pays.
- Transparent.
- Expectation management.
- Practical solution.
- Value chain.
- Professionalism.

1.3 Workgroup Alignment of the stakeholders

The Workgroup involves various key partners as members. To create a bigger support and get feedback of the involved partners a stakeholder meeting will be organized by TNO. The report resulting from the stakeholder meetings will be delivered by TNO. This TNO report will address particularly the long-term solution of Aruba's waste challenges.

The purpose of the stakeholder meeting is to come up with a roadmap for the long-term solution for the implementation of solid waste management in Aruba where all parties in the community have been heard.

2. Short term approach

The short-term period as described in the above definition, consists of 90 days in which the Minister of Spatial Development, Infrastructure and Environment intends to cease the landfilling activities at Parkietenbos. The landfill activities are threatening the surrounding environment and the health of the workers (direct and indirect) and the residents living in the area, therefore it is of high importance to cease the landfilling activities. Ceasing the landfill activities will involve that waste cannot be deposited on the landfill. Waste going to the landfill must be then redirected to another place or processing method. The Workgroup was subdivided in various smaller groups, based on field of expertise.

The technical group explored the local options for a short-term solutions and proposed a couple of possible solutions. An international short-term solution is not feasible in a short period in which the Minister intends to close the landfill. The different short-term options will be presented in this section of the report and furthermore the pros and cons of each option will be presented. A feasibility study still has to be executed for each option.

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2.1 Past Short-term Approaches

Waste on the Island of Aruba has always been disposed in landfills. The Landfill at Parkietenbos is currently the only legal public landfill, used to dispose the Island's household waste and other waste streams collected from waste companies. In the late 1990's there were reports made that the landfill will reach its maximum carrying capacity by the end of that decade. Now after nearly two decades, the landfill at Parkietenbos is still being used and has grown extensively over the past years.

In the past, there were several short-term approaches for disposing of the waste. Areas on the Island, like Gabilan, were used to (land fill) dispose of for instance construction waste and landscaping waste until late 2014 when the waste caught fire and caused a huge nuisance for the citizens living downwind of the landfill. The landfill has been closed and is now a sand depot for the Public Works. In addition, other known short-term approaches were the landfill at Seroe Patrishi and Jaburibari, which has since been landfilled and Jaburibari is now a known recreation area for the local residents called Parke Curason. All those quarries were landfilled with specific wastes, like construction and yard waste. Since then and to date, there are different quarries that are illegally used to dispose of all kinds of waste with detrimental effects for the public health and the environment.

As waste has been and still is the main concern and a nuisance for the surrounding residents of Parkietenbos, the Minister of Spatial Development, Infrastructure and Environment has set a priority for the Government of Aruba (GoA) to find short, mid and long-term solutions for the Island's waste management.

2.2 Waste Streams Aruba

In order to determine the short-term solution as a transition phase for the mid and long-term approach, an assessment was made of the different waste streams. Each waste stream (see annex 9.5) that Serlimar received at the landfill was identified along with their current and short-term processing method. For most waste streams, the current processing method is either landfilled or stored at Parkietenbos. See table 2.1 for the overview per waste stream and their possible short-term processing method.

The majority of the waste that makes up nearly 80% of the total waste volume, deposited at Parkietenbos, are the households and commercial waste (see Chart 2.1). Most of these wastes can be redirected to be immediately processed and baled in order to separate the non-hazardous materials.

Other waste streams that currently takes up a lot of volume is the plant/yard wastes that is collected through landscaping activities all around the Island. This waste, which the majority are produced from the Government contractors can be redirected and burned in a controlled open-air burner. However, this waste can also be shredded using small shredders onsite during landscaping activities done by the contractors. The shredded materials can then be spread onsite in order to enrich the soil.

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Table 2.1: Overview waste stream and their possible short-term processing method

Waste Streams:	Current:	Short:
1. Household	Landfill	Separation and Baled
2. Commercial	Landfill	Separation and Baled
3. Yard/plant	Landfill	Open Air Burn Controlled
4. Asbestos	Asbestos Cells	Asbestos Cells Parkietenbos
5. Pallets/woods	Open Air Burn Controlled	Open Air Burn Controlled
6. Glass	Landfill	Store Parkietenbos
7. Metals/Car wrecks	Store PARKIETENBOS	Store Parkietenbos -> DALTRA
8. Sand/stones	Landfill	Cover material Parkietenbos / Quarries/ Recycle
9. Construction/demolish	Landfill	Recycle
10. RWZI sludge	Burn/Dry -> Landfill	Open Air Burn Controlled
11. Plastic	Landfill	Separation and Baled
12. Tires	Store Parkietenbos	Store Parkietenbos Controlled
13. Paper/cardboard	Landfill	Separation and Baled
14. Vegetable Oils	Store Parkietenbos	Antilia
15. Mineral Oils	Store Parkietenbos	Refinery
16. Carcass/carrion	Burn -> Landfill	Open Air Burn Controlled
17. Medical	Burn -> Landfill	Special treatment @ Source
18. PTS mixed	Landfill	Separation and Baled
19. Furniture/carpet	Burn -> Landfill	Separation and Baled
20. Hazmat Residential	Landfill (mixed with household)	Hazmat storage Parkietenbos
21. E-waste	Landfill	Hazmat storage Parkietenbos

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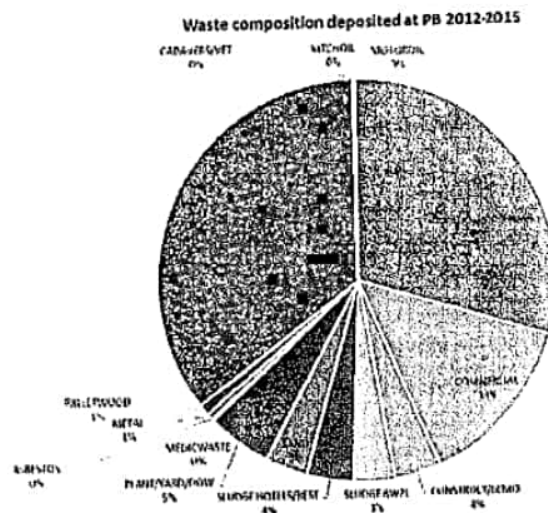


Chart 2.1: Waste composition deposited at Landfill Parkietenbos 2012-2015

Medical waste and animal carcasses can be burned through a controlled open-air burner. These waste streams especially medical waste will need an urgent approach for redirection or treatment at the source as they consist of possible diseases that can have serious public health problems if not processed properly.

The Workgroup is of the opinion that even when the majority of the waste streams are re-directed, some of the waste streams will still need to be landfilled, either at a small area at Parkietenbos or somewhere else, also known as a sanitary landfill. For instance, hazardous waste like asbestos, batteries, tires and vehicle fluids needs adequate storage or recovery facilities. Therefore, the creation of this new sanitary landfill cannot be excluded from the decision as to any potential waste solutions. Ash, which is a rest product of any waste that will be burned, also need to be landfilled. The Workgroup recommends that ash to be landfilled in a sanitary landfill. A sanitary landfill should be part of the mid or long term solutions.

2.3 Options

As aforementioned, the main objective for the short-term approach is to assess different alternatives for processing the Municipal Solid Waste (MSW) of Aruba. The following four options are for the Refuse Derived Fuel (RDF¹) that makes up most of the total waste volume i.e. household, commercial and plant based materials and excludes the processing of hazardous materials that cannot be landfilled, therefore needs adequate storage or recovery facilities.

During several brainstorming sessions, presentations and site visits, the Workgroup has listed four options for the short-term approach and they are as follows:

¹ RDF is the product of processing municipal solid waste to separate the noncombustible from the combustible portion, and preparing the combustible portion into a form that can be effectively fired.

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1. Segregate all the MSW through EcoGas, compact and package the RDF in plastic bags, after which the bales are disposed of in the existing quarry located at Sero Teishi and other existing quarries. Before disposing of the RDF bales regular independent laboratory analysis is required for hazardous materials:
2. Segregate all the MSW through EcoGas and incinerate the uncompact RDF in an open-air curtain burner (at Parkietenbos or the Refinery):
3. Segregate all the MSW through EcoGas and incinerate the uncompact RDF in an open-air curtain burner with stacks (at Parkietenbos or the Refinery), this is not a short-term solution as the stacks still need to be design and constructed:
4. Segregate all the MSW through EcoGas and dispose of the packaged RDF in a landfill at the Sero Teishi/Refinery of Aruba (RDA)/other sites.

The possibility for a smaller landfill area should be explored since there will always be waste that has to be landfilled (residual).

2.4 Communication and implementation

Implementation of the short-term solution consists of various factors. Serlimar needs to do a cost/benefit analysis in short term for the selected approach. There should be a team to do the necessary negotiations with the involved parties. This will consist of financial, technical, logistic, partnership and other important issues. The negotiations should be started very soon to reach the final day of closing the landfill. Expert and experience assistance should be given to Serlimar in the negotiation to reach an outcome desirable win-win situation.

2.5 Preliminary conclusions and actions

A communication plan should be created and implemented to make the public aware of this decision where waste processing will go through change in the upcoming short period. The community and the commercial sector should be informed that the waste processing system will be redirected and that new procedures are in place. This all to prevent illegal dumping of the waste around the island. The enforcement of the authorities should be in place also to prevent the illegal dumping of waste, which could increase because of the new short-term and the possible misinformation regarding this new situation.

To address the urgent need and solve the current waste handling problems at Parkietenbos the Workgroup concludes the following short-term actions:

	Actions	Responsible party
1	Calculating the costs to determine the feasibility of the options.	Outsource to Accountancy firm
2	Start negotiations with EcoGas to receive and separate all household, commercial and yard waste.	Serlimar, EcoGas and DWIZ
3	Check, legally who is ultimate responsible and owner of the waste, which is not bald.	DWIZ
4	Serlimar and the Unions have to dialogue on the expected changes.	Serlimar, STA and SEPPA
5	Harmonize and standardize the waste streams definitions and reporting method.	DNM and Serlimar
6	Tariff determination for covering the costs of waste processing, taking into account a social tariff system.	Serlimar and EcoGas and Johnson (for burning some waste streams)

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7	Calculate the settlement between EcoGas and Serlimar. Serlimar has to make a budget for the services to be provided by EcoGas and Johnson's.	Serlimar, EcoGas, Johnson's and Accountancy firm
8	Come to an agreement with RDA and Johnson's for the burning at San Nicolas, if RDA is to be appointed as burning area of certain waste streams.	Ministers, RDA and Johnson's
9	Draft an agreement for EcoGas, Serlimar, Johnson and Aruba.	EcoGas, Johnson's and Serlimar
10	To start drafting a permit system for the collection and deliverance of the waste streams.	DWJZ
11	A part of Parkietenbos cannot be closed, such as the weighbridge, PTS, storage of tires and metals, and asbestos cell. The general landfill and uncontrolled burning outdoors should be stopped as soon as possible.	Serlimar
12	Installation of a negotiation team for a short-term contract	Minister
13	For further analysis and information gathering, meetings are still being convened with the Technical workgroup and TNO.	Technical workgroup and TNO
14	Redirect commercial and residential collected waste, and other waste streams to the EcoGas installation, where the waste is separated (see table 2.1).	Serlimar and EcoTech and other private collectors
15	For the implementation of any option, the implemented solution may not cause nuisance.	Serlimar and EcoGas
16	Landfilling of RDF bails at Sero Teishi under supervision of Serlimar for at least a one-year period. Sub-option is to excavate the Sero Teishi area to extend the capacity.	EcoGas and Serlimar
17	Determine other landfill area for the short-term solution and for specific waste streams as Sero Teishi.	DNM, DOW and DIP
18	Supervision on the required monthly taken samples of the RDF.	DNM and DVG
19	There has to be a redundancy and contingency plan.	Serlimar and EcoGas
20	Periodically carry out waste characterization surveys to update information.	Serlimar and EcoGas
21	Venting tubes for the release of the landfill gasses.	Serlimar
22	Data actualization is very important for any decision that has to be taken for the long-term solutions. Data should be shared among Government Authorities	Serlimar, EcoGas and DNM
23	Analysis of the involved costs	Serlimar or outsource this
24	Audit if this facility operates according to health and environmental standards, indoors facility and outdoors.	PAHO in cooperation with DVG and DNM

3. Mid and long term approach

For the mid-term approach, the Workgroup recommends to add on or complement the short-term approach. In addition, take additional action to prepare for the long-term solution. As a modern society, Aruba is still at the bottom of the Lansink's ladder (waste hierarchy, figure 3.1) with respect to the solid waste management. In reference, the solid waste management challenges are addressed according to the waste hierarchy (figure 3.1).

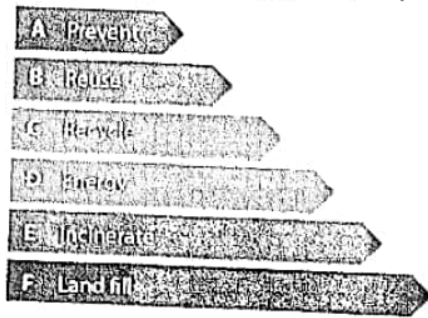


Figure 3.1 Waste Management hierarchy.

3.1 Mid-term Approach Options

Option 1:

The main solid waste streams should be delivered at and treated by EcoGas. EcoGas will continue to provide the same services as in the short-term solution during the mid-term period up until a long-term solution can be implemented. The waste streams which were not redirected (asbestos, metals/car-wrecks, tires, vegetable and mineral oil, hazardous, medical waste) will be addressed in the mid-term period.

Waste streams with an energy content (calorific value) will be redirected to EcoGas. Waste streams with no energy content and are hazardous will remain at Parkietenbos, but should be treated as hazardous waste. Hazardous waste should be handled and separately stored in designated facility by knowledgeable personnel. Serlimar to take care of this process of hazardous waste. Personnel should be trained by experts on handling hazardous waste (especially residential hazmat). The Workgroup also recommends Serlimar to initiate a new collection mechanism for residential hazardous waste. In order to guaranty the quality of any products of any waste processing methods for mid- and long-term solutions, the residential hazardous waste should be collected separately and stored in a designated facility.

Option 2:

The analyses of the Bouldin & Lawson facility should be considered as a mid-term approach. However, an extensive evaluation of the current status of the plant should be done by Serlimar. The Bouldin & Lawson facility has two different sections that process the incoming residential and commercial waste. The first section is actually a Material Recovery Facility (MRF) system where waste is shredded, separated by magnets/eddy-current, blowers, etc. The second section is the so-called HOG part, which is a big steaming unit that steams the residual of the first section in a component called Fluff. The Fluff can be used to produce different material such as plywood or wood materials (additional equipment is required). The Fluff can also be converted by an additional facility to produce electricity. In addition, the Fluff can be used for landfilling purposes as was

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described in the original plans. Another end use of the Fluff is as a soil moist enhancer. The possible use of the Fluff should be studied when the status of the current facility is known. Another option is to convert the Bouldin & Lawson facility into a facility fitting the current solid waste management. Furthermore, remaining waste streams will be addressed and if needed re-directed to complement the short-term solution.

The waste streams entering Parkietenbos, should be harmonized and standardized.

3.2 Long-term Approach

For the long-term approach, the Workgroup advise an integrated solid waste management facility with thermal, recycling and sanitary landfill. To implement these long term solutions, the Government of Aruba has decided and will invite parties to participate in a RFI (Request for Information) conducted by WEB (lead) and the technical group.

The recycling facilities should be in line with the circular economy approach.

As part of the long-term solution, the Government of Aruba has decided to invite parties to participate in a second RFI, which TNO will be in charge to conduct. This RFI will invite parties to come with solutions to remediate the existing landfill at Parkietenbos.

3.3 Communication before implementation

Communication is the key for success. Lessons learned introducing waste solution or new environmental approaches need to be imbedded in a workforce and community, which are aware and willing to support the new facility. Investing in a technical solution envisioning positive impacts and behavior of citizen is not enough. Part of the success is the awareness and knowledge of the workforce at Serlimar, other waste handlers and involved parties in the value chain. Furthermore, to address a community challenge, the citizens have to be involved in supporting the solution. A National Awareness plan has to be unrolled, where different targets groups are considered.

3.4 Preliminary conclusions, Recommendations and Actions

Mid-term actions will be the complementation of the Short-term actions. The waste stream that are not handled in the Short-term solutions will be redirected and handled. The Workgroup concludes the following Mid-term actions:

	Actions	Responsible party
1	Assessment of Waste characterization	Serlimar and EcoGas
2	Bio-hazardous waste separately handled and treated	DVG
3	Car wrecks and tires	Serlimar (outsource)
4	The solid waste management legislation is revised and taken in procedure, enabling recycling and circular economy approaches.	DWJZ
5	Enforcement is in place and the local authorities are taking the required control.	DNM, BCI, DWJZ, OM
6	Waste streams not redirected in short-term will be redirected in mid-term	Serlimar and other parties

4. Restoring Parkietenbos Landfill

The landfill at Parkietenbos has already exceeded its capacity. The condition on which the waste is being disposed are not as was planned in 2002, when a new landfill cell was created for disposing waste streams received at Parkietenbos in a controlled way.

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As the Government of Aruba is looking forward to a new waste management facility, the current landfill will be remediated to avoid any risks threatening the environment and the human health.

4.1 TNO report

In December 2017, TNO has submitted a remediation plan for the landfill at Parkietenbos. A study was conducted by TNO for possible solution for the remediation of the landfill at Parkietenbos. TNO has proposed remediation measures in its report. Recommending that the landscape have to be reshaped, the base should be reinforced at the seaside, the top should be shielded with a cover layer, the gasses produced by the landfill should be managed, and the ground and surface water should be monitor. TNO mentioned also that the remaining life span of the landfill is 2 years (from May 2017). In a worst-case scenario, TNO indicated that the landfill could be used for 4 to 5 years, but this will involve an incline up to 40 meters of the current landfill height. TNO did not advise to follow this scenario. After remediation of the landfill according to TNO proposal, the area could be used as a solar energy park, nature area, for industrial activities or other activities.

4.2 Additions to the TNO report

After analyzing the TNO suggestions, the Workgroup is of the opinion that the human factor regarding the remediation of the Parkietenbos landfill was not included. Any remediation plan of the landfill at Parkietenbos should have included the situation in which the residents of the surrounding are living in. The isolation, management and control of the landfill is the option that TNO is proposing. The Workgroup is of the opinion that a more comprehensive approach should be taken to solve the problems and the risks of the current situation of the landfill. The mining of the landfill at Parkietenbos should be an option, as this will remove all the possible future hazard effects of a landfill in the area. However, this should be done only after studying the possible risks for the environment and the human health. The long-term solution for the waste management in Aruba should consider the removal of the waste already stored in the landfill at Parkietenbos (the landfill area from 2002 until now). The levelling and restoring of the area to its previous conditions is a key factor for mitigating the risks in the future for the community living in the area and the environment surrounding the landfill.

4.3 PAHO TNO report

The Department of Public Health, through the Ministry of Tourism, Public Health and Sports, requested PAHO technical cooperation to bring to Aruba an expert in waste management, to assess the problem of solid waste in Aruba and its possible solutions, in conjunction with the Solid Waste Management Committee. The visit is expected for the month of February 2018.

The PAHO technical advisor will conduct amongst other the following activities:

- a) Visit and analyze the legal and illegal dumpsites (Situational analysis).
- b) Describe the impact and risks of the waste on health and the environment.
- c) Advice on possible reduction/elimination of the Parkietenbos landfill: short, medium and long term as a problem of public health and environment.
- d) Advice according our legal framework and international regulations for the monitoring and monitoring of gas and ash emissions derived from the final processing of solid waste.
- e) Advice on hazardous and non-hazardous solid waste, including medical waste.

The result of the visit will provide support and potential solutions to the problem of solid waste in Aruba.

5. Restoring quarries

There are 30² specific and known quarries on Aruba. The quarries are a result of the mining of sand gravel and limestone and sold as building material. Once a quarry is exhausted most of them are used as landfill. The 2012 report to address the illegal landfilling is called 'Cero Tolerancia', which indicated that illegal landfilling was not allowed. However, the contrary happened. The Algemene Politie Verordening (APV) law prohibits dumping without the permit of the Minister. All landfill companies should have a nuisance permit. Furthermore, mining and landfilling are considered industrial activities, which are not compatible in residential or nature areas according to the zoning law.

The only designated landfill in Aruba for disposing of waste is the landfill at Parkietenbos under the management of Serlimar. The dumping of waste at all other locations is prohibited.

5.1 Revision of Cero Tolerancia report

The implementation of the Cero Tolerancia report was contrary to what the report aimed for. The legal instruments were not used, no permits were given, and no civil servants were appointed to enforce this policy. Although the Prosecutor together with the Police and DNM drafted an enforcement policy according to the Cero Tolerancia report. Only one illegal dump manager was prosecuted, while other illegal dump managers went on with their activities by means of an oral approval of the previous Minister of Spatial Development, Infrastructure and Environment.

The excavations in Aruba concern open mining activities for the exploitation of soil resources. Sand, gravel and limestone are excavated and sold. The remaining quarries are a scar in the landscape of Aruba. All the excavations concerning mining activities are on property land.

5.1.1 Restoring of the illegal dumpsites and quarries

The illegal dumping of waste has increased considerably in the last decades. Companies often use illegal landfills to lower their waste handling costs by avoiding the costs at the official landfill at Parkietenbos. The illegal dumping of waste causes a great deal of nuisance to the local residents in the form of smell, smoke, dust, noise and vermin. Some potential environmental impacts of these illegal activities are soil contamination, groundwater contamination, sea and air pollution because of the illegal dumping of waste.

It is desirable that illegal landfills be restored in an environmentally friendly manner and according to specific guidelines. These guidelines should be stipulated in the permits. Eventually, these areas will get a different land use, for example for recreation, parks, solar panels parks and sports activities.

Conditions for restoration of these illegal landfills are that an agreement is concluded between Land (Serlimar) and the landowners. In order to legalize these illegal landfills, they have to be designated as a landfill in accordance with Article 55 of the APV, and they must have a nuisance permit.

From the inventory of the illegal landfills, a priority should be set which illegal landfills will be primarily eligible for replenishment and restoration. The priority is based on risks for the environment and health of the residents, access to the quarries, the zoning map (residential area, rainwater catchment area, gullies, nature reserve, etc.) and the degree of nuisance for the local residents.

² DIP will summarize a list of the quarries.

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Finally, legislation and policy must be formulated for excavations of sand and stone crushers to prevent excavated areas that can eventually be used as illegal landfills.

The following table gives an indication of the landfills and quarries known by the Workgroup (source DNM).

Table 5.1: list of quarries with illegally deposited waste

Name illegal landfills	Status	Status ¹	Remarks
Alto Vista	Property land	Non Active	Ground Level reached
Babiljn (Dirks)	Property land	Non Active	Ground Level reached
Hoolberg	Property land	Non Active	Ground Level reached
Jaburibari (Albo)	Property land	Non Active	
Lagabena 1E	Property land	Active	
Lagabena Varis	Property land	Active	
Matadera (Dijkhoff)	Property land	Active	
Matadera (Ruiz)	Property land	Active	Ground Level reached
Meiveld	Property land	Active	
Moko (behind Moko 30)	Property land	Active	
Mon Pos	Property land	Non Active	Ground Level reached
Parrish Hill	(Land Aruba)	Active	
Piedra Plat	Property land	Non Active	Ground Level reached
Rool Kochi	Property land	Non Active	
Seroe Janchi (SI46)	Property land	Non Active	Ground Level reached
Seroe Patrishi (SB125)	Property land	Non Active	
Shaba	Property land	Non Active	
Sombre	Property land	Non Active	
Tamarijn	Property land	Non Active	Ground Level reached

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Table 5.2: list of quarries without waste

Name of quarry	Domain ground and Cadastral index	Status ³	Remarks
Babijn (Gallero)	Property land	Active	Sand and stone extraction.
Jamanota	Property land (3-D-120)	Unknown	
Matadera	Property land (1-L-1273 en 1274)	Unknown	
Moko	Property land	Unknown	
Sero Crystal	Property land	Active	Sand and stone extraction
Sabana Grandi	Property land (1-T-233)	Unknown	
Sero Teishi	Property land	Active	Sand and stone extraction
Sabanilla Abou	Property land (3-B-743)	Unknown	
Santa Marta	Property land (1-T-15)	Unknown	
Sombre (near Sombre29)	Property land		

5.2 Pre-conclusion and advice

The Workgroup unanimously agreed that the quarries should be restored according to the legal procedures, which are already in place. The APV and Nuisance Act should be implemented as is and civil servants should be appointed to enforce these regulations. Restoring of the quarries should take place only with inert (waste) material. The Workgroup concludes furthermore to consider a moratorium on excavations of sand and stones, and to recycle construction and demolition debris.

5.3 Legal requirements

In accordance with Article 55 the General Police Act, the dumping of waste is only possible at a landfill designated by the Minister of Public Works.

The owner or manager of a landfill should request for a permit to the minister according General Police Act article 55 and a request for the nuisance permit should be requested at the Legal Department (DWJZ).

³ Active means the extraction of sand and/ or stone

5.3.1 Spatial Zoning

Conform the zoning map below (Bedrijven en Belemmeringen) - Companies and Obstacles are amongst others the excavations up to 1998 Included.

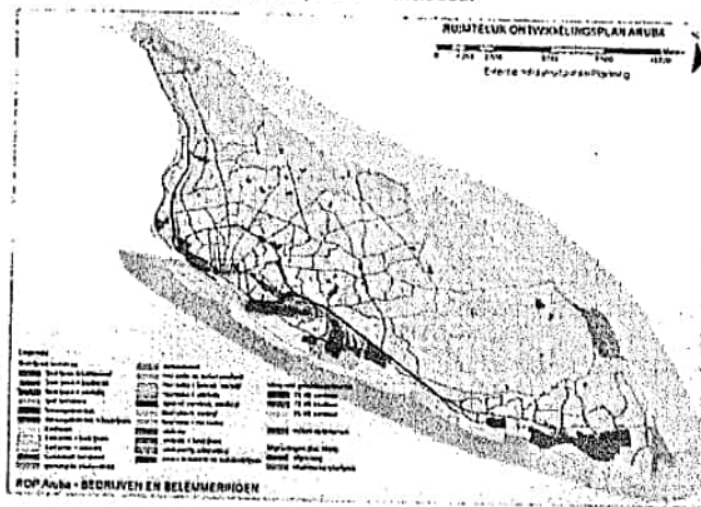


Figure 5.1 zoning map - Companies and Obstacles, ROP 2009.

The quarries are illustrated in the 'Ruimtelijk Ontwikkelingsplan Aruba (ROP)'. The Spatial Development Ordinance main objective is to reduce excavations and eliminate them in the near future. Furthermore, it is necessary to restore the landscape of the areas that are released and allocate them to light functions such as recreation.

Without further application of Instruments provided by the National Decree on Spatial Development (ROPV, planning permission, etc.) there are limited possibilities to redirect this development. The intention is also to try to reach to an agreement with the landowners of the excavation areas. There are two possibilities for an agreement according to DIP:

- A. The landowner remains the owner. In such case a lease or user agreement is concluded to complete the quarry so it can be set up as a sanitary landfill with the possibility for future development of a park or recreational activities.
- B. The landowner sells the land for a symbolic price with the Government of Aruba who then becomes the owner. Subsequently, the quarry can be completed and arranged as a sanitary landfill with the future intentions of setting it up as a park or recreation space.

In the case of a lease or user agreement, it must be taken into account that the Minister of Spatial Planning, Infrastructure and Environment is authorized under the Accounting Regulation to enter into contracts for a maximum duration of 5 years and must be provided for this purpose in the budget.

In the case of land acquisition, the value of the land must be valued. The costs must also be included in the budget. In case of land exchange, the Minister is competent, if it concerns a land exchange with a closed stock exchange (i.e. on the basis of equal values) and the shelf value does not exceed AWG 50,000. If not, this must be done by national decree (State Ordinance issuing property, article 27). This does not mean that lands of the same size are exchanged, but grounds with an equal value.

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The value of a quarry is normally being lower than the value of a piece of land that has not been excavated.

5.3.2 Nuisance and Cleanliness

Landfill causes nuisance and have an impact on the environment and public health. To establish a landfill, the owner/operator needs a nuisance permit. The landfill should be designed and operated to prevent impacts from nuisance factors and comply with any local government nuisance regulations. Therefore, it is necessary to conduct assessments, modeling and/or monitoring so it can be determined and predicted what the actual nuisance levels shall be acceptable within the environmental standards. This includes nuisance due to dust, noise, litter, odor, vectors, and other direct or indirect factors. A complaint response procedure is essential to be developed and posted on-site for responding to nuisance complaints.

5.3.3 Enforcement

The involved enforcement government departments OM, KPA, DNM and BCI should revisit the Enforcement Policy "Suchi na su lugar" and the enforcement arrangement. The civil servants at these departments should be equipped with the necessary authorities (toezichtbevoegdheden en opsporingsbevoegdheden). Next to the assignment of these authorities, the department should be equipped to go out in the field and do the surveillance with among other vehicles, air and noise monitoring equipment.

In relation to enforcement solid waste legislation, some of the following activities need to be undertaken:

- Improvement and streamlining of means of receiving complaints and reports from the public.
- Implement a national awareness campaign on the do's and the don'ts.
- Emphasis on enforcement in continuing environmental education and awareness campaign.
- Information campaign on the negative impacts of illegal burning and dumping of wastes.
- Weekend and after office hours inspections.
- Fortify relationships with stakeholders.

5.3.4 Building Code

After the quarry is landfilled and the landscape has been restored the area should rest and ripe before anything is built on it. The current building code requires only technical aspects of the building, but it should also take the supporting weight into consideration when an area has been landfilled.

The area should be designated for light areal needs, like solar parks, recreational and nature areas.

5.4 Monitoring

After a thorough assessment, the Technical group concluded that monitoring is essential. The monitoring program should be defined and composed into a report with all the criteria, which are essential. A detailed Environmental Monitoring Plan for:

- Leachate;
- Groundwater;
- Surface water;
- Landfill gas.

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An environmental monitoring plan must be prepared in advance and must be implemented during landfill construction and landfill operation, during closure and post-closure. An environmental Plan demonstrate that the monitoring results are consistent with the available plans and international standards. It is also an instrument, which demonstrates compliance with the performance criteria.

DNM as a dedicated department should be re-enforced with more knowledgeable personnel and equipment to execute this task.

6. Legal framework

6.1 Current legislation

The current legal framework for waste processing, waste disposal and excavation for waste disposal is brief. In public law, the following laws and regulations can be mentioned:

1. De Algemene Politieverordening (AB 1995 no. GT 8, hierna APV te noemen).
2. De Hinderverordening (AB 1988 no. GT 27) en het daarop gebaseerd Hinderbesluit (AB 1995 no. GT 20).
3. De Landsverordening Voorkoming verontreiniging doorschepen (AB 1993 no. 72).
4. De Landsverordening Instelling Servicio di Limpiesa di Aruba (AB 2005 no. 5).

6.1.1 De APV

The APV regulates:

- The dumping, filling and use of waste on open or closed areas.
- The offering household waste at the source.
- The dumping of waste and designation of landfill sites.

6.1.2 The Nuisance Act

The Nuisance Act regulates:

- A permit system for establishments included in the Nuisance decree.
- A waste disposal facilities and installations for the storage or processing of scrap or waste, are facilities, which requires a nuisance permit.

6.1.3 The Marine Pollution Act

The Marine Pollution Act regulates:

- The Prohibition to dump hazardous substances in our territorial waters.
- The responsibility of the managers for the needed reception facilities to receive the hazardous substances coming from the vessels.

6.1.4 The National Ordinance Institution Serlimar, Servicio di Limpiesa di Aruba (AB 2005 no.5)

The National Ordinance Serlimar regulates:

- An amount that can be requested as compensation from a collection point for the collection and processing of household waste.

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- An amount that can be claimed as compensation for waste that is offered to it for processing.

6.2 Needed legislation or changes of regulations

6.2.1 Processing of waste

In 2012 a draft for a National Ordinance containing rules for the management of the environment (National Ordinance Environmental Management: Landsverordening Milieubeheer) has been drafted. This draft includes a chapter (namely Chapter 4) on the collection and processing of waste. A permit system is incorporated in this draft and is supposed to be introduced for the purpose, with which the collection, storage, processing and transport of waste (including hazardous waste) can be regulated. The text of this chapter is attached as Annex 9.7 to this note.

Since the introduction of the National Ordinance Environmental Management, as it appears, is still to be expected, it may be considered to introduce Chapter 4 in a modified form as a separate national ordinance. This in anticipation of the introduction of the National Ordinance Environmental Management. This implies that the APV will also have to be adjusted. The draft National ordinance on environmental management contains an example for this, which is attached as annex 9.8 to this report.

6.3 Enforcement

Both the APV and the Hinderverordening as the National Ordinance Prevention Pollution by Ships contain supervisory provisions on the basis of which supervisors can be appointed who are charged with supervising compliance with the provisions of or pursuant to those national ordinances. To this end, certain authority should be granted to these supervisors in order to be able to enforce these regulations.

It is also worth noting that in the APV first all police officers are designated as supervisors and are therefore charged with supervising compliance with the provisions of or pursuant to the APV. In addition, persons other than police officers may also be charged with supervision with regard to the provisions laid down by or pursuant to, inter alia, articles 28, 29, 53, 54 and 55. Incidentally, "other persons" may also be non-civil servants. In this case, the supervision is limited to those provisions of the APV that relate to the dumping of waste or refuse as well as the removal and processing of waste or refuse.

With the supervision of compliance with the provisions laid down by or pursuant to the Nuisance Ordinance, only (unspecified) civil servants can be designated.

The investigation will be charged, in addition to the officials referred to in Article 184 of the Code of Criminal Procedure of Aruba, and other civil servants designated for that purpose by national decree. Based on the latter, special investigating officers can also be appointed for the detection of violation of Articles 28, 29, 53, 54 and 55 APV. This concerns officials from other services than the regular investigating authorities.

The Nuisance Ordinance does not contain any provisions similar to articles 70 and 71 of the Dutch Civil Code: no special investigating officers can therefore be appointed for the investigation of offenses made punishable by or pursuant to that ordinance. Established violations can therefore ultimately only be enforced by means of a report to the regular investigation authorities, followed by (possible) investigation and prosecution by those authorities.

With both the APV and the Hinderverordening the law enforcement is not possible. After all, both national ordinances do not have a legal framework for this.

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Consideration could be given to strengthening both the APV and the Nuisance Regulation with the aforementioned administrative law enforcement instruments. This could be done by including a statutory regulation in the APV and the Nuisance Ordinance on the basis of the already existing legislation in the field. An alternative to this is awaiting the establishment of the National Ordinance on General Administrative Law (LABB), the draft of which is now ready for presentation to the States. The LABB intends (inter alia) to provide a general legal framework for the supervision of compliance with legal requirements, as well as for the administrative enforcement of these statutory regulations. This will also include the APV and the Nuisance Regulation.

7. Strengthen Serlimar's Position

Serlimar Sui Generis (SG) was established in 2005 as an independent company by the Government of Aruba. Before 2005 Serlimar was a government department with main tasks to collect, transport and process waste. Those tasks continue to be Serlimar SG primary responsibilities. Currently Serlimar is the operator of the landfill Parkietenbos. At this moment they are not capable to manage the landfill in an environmental responsible way. For the implementation of the Short-Term solutions, Serlimar needs to be strengthened and supported by dedicated waste handling training and operation procedures and protocols. This should be a priority that should go hand in hand with the implementation of the Short Term Solutions.

To be financially self-supportive Serlimar SG received the right to collect fees for all the services it gives to the community. Actually Serlimar is not receiving enough funds to be self-sustainable, part of their funds are a contribution of the Government of Aruba, as Serlimar is not collecting enough resources for its operations and costs. A big majority of the household customers are not paying the fee for residential services that was introduced in 2015. The waste streams delivered at Parkietenbos also has been reduced due to competitions and due to illegal dumping. All this contributes to financial problems for Serlimar's daily operations, investments and other costs. For this reason, it is important to consider adaptation in e.g. Serlimar's legislation, in order for Serlimar to increase its revenue to a more self-sustainable level. The main goal of this task is to come with suggestion to make Serlimar a self-sufficient company.

7.1 Revenues

The Workgroup agrees that the ordinance of Serlimar has to be implemented. According to the Workgroup there is enough tools in the regulation for Serlimar to collect revenues for its services and tasks given to the community. Some adaptations are proposed for the ordinance such as mandatory levy for the commercial waste, like the levy for the residential waste. But this is more a long-term approach. The main objective is that everyone has to pay for the waste management in Aruba. We all produce waste, therefore we all need to take responsibility for it to be properly removed from the waste cycle in an environmental friendly way.

If Serlimar wants to be self-sufficient and everyone be required to pay, there need to be changes in the way the waste cycle is handled. First of all, all the waste streams need to be destined to the final legal waste processing destination. Legal frame works has to be made to ensure that the collectors and transporters of waste do have the appropriate licenses given by a Government Authority. This permission structure should have the right provisions of which the collector and transporter must comply with. No agency can collect and/or transport any type of waste without a permit. This permit must be arranged through an ordinance specially made for the license system ("Afvalstoffen Verordening") as suggested in chapter 6.3.1. This license system will also help prevent that waste

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will not be dumped illegally around the island. The law enforcement agencies should have the necessary tools, instruments and empowerment for this license system to be effective.

Other problems that have to be addressed regarding revenues that Serlimar must collect are the administrative system and the database of Serlimar's clients. Without a proper administrative system and database, it will be difficult to collect the revenues in an efficient way. The automation of the administrative system has to be done. Serlimar also has to update its database. The Workgroup is of the opinion that information has to be shared between Government Organizations such as WEB and Censo, which should have the most updated database of the Aruban community. To start a new database by Serlimar, will take a lot of time and also take years to be updated. The revenues that must be collected by Serlimar must be sufficient for Serlimar to be an independent company.

The introduction of a social rate for waste collecting and processing for residential waste is also necessary for some groups in the community, like elderly or minimum income families. The introduction of a social rate will help those groups in our community to support the waste management system of Aruba in a more understanding and balanced manner.

The Workgroup is of the opinion that a National Campaign must be implemented to educate and make the public aware about the processes of waste management and the costs involved in this process.

7.2 Role of Serlimar SG

Serlimar SG will need to have a more important and central role in the waste management cycle in Aruba. The role of Serlimar SG has to be an organ that receives all the waste handling revenues, comply with its own tasks of collecting and processing, and outsource to other organizations for the processing and handling of certain waste streams. Certain services that Serlimar already has the majority in the market, like the collection of residential waste, can be maintained as primary tasks of Serlimar. Other responsibilities that need for example certain expertise can be outsourced to third parties.

7.3 Services

For Serlimar to be a self-sufficient company and to be competitive against its competition, new services must be introduced that will bring more revenues for the company. At this moment some additional simple services can be implemented in short-term to help Serlimar receive more profits. The management of Serlimar informed the Workgroup that they are already preparing to come with some new services to increase their revenues. Other more complicated services can be planned and implemented, but the new role of Serlimar must be clear and especially the vision and mission of Serlimar in the future.

At this moment, it is very difficult to reorganize Serlimar as no clear vision and mission is known for Serlimar. The long-term solutions for waste management are not established yet. Without this decision, it will be difficult and not responsible to do a reorganization of Serlimar.

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8. Conclusion and Advice

Based on the findings of the Workgroup our conclusion is:

1. The Serlimar landfill Parkietenbos exceeded all limits, environmental and health standards.
2. A short-term solution is necessary to remediate the landfill Parkietenbos.
3. As a short-term solution the Workgroup recommends that the majority of the waste streams (household, commercial and yard waste) are redirected to EcoGas.
4. The solid waste should be separated. The RDF should be bundled in plastic bags, these bales should be tested by a lab for toxicity and then be landfilled at a designated landfill.
5. For the implementation of this short-term solution, a team has to be installed to negotiate a contract between EcoGas and Serlimar.
6. For the long-term solution, the Workgroup recommends to outsource this with two Requests for Information. One RFI for the Integrated waste management facility (recycle and thermal) and the second RFI for the remediation of the landfill Parkietenbos and a new sanitary landfill for specific waste streams.
7. A National Awareness Campaign is needed to inform the citizens and companies.
8. Environmental laws should be extended and adapted in order to have a legal framework for the long-term solution.
9. Serlimar should be strengthened in order to be able to supervise, manage, compete and be self-sustainable.

9. Attachments

9.1MB Workgroup

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9.2 Inventory

In order to meet the set target in the Ministerial Decree to come with a short-term solution within 45 days, the Workgroup made an inventory of the solid waste management practices on the island. The inventory focusses on solid waste management matters, which are environment sound, and/or is financially more attractive.

9.2.1 Refinery of Aruba N.V.

On December 12, 2017 a field visit has been organized by the Bureau of the Minister to visit the Refinery of Aruba (RDA). The following entities were present, Department of Infrastructure and Planning, Department of Nature and Environment, Department of Public Health, Public Works, Refinery of Aruba, CITGO and Bureau of the Minister.

Three locations in the refinery were visited, to assess the potential use of the area as temporary solid waste management option among other landfilling.

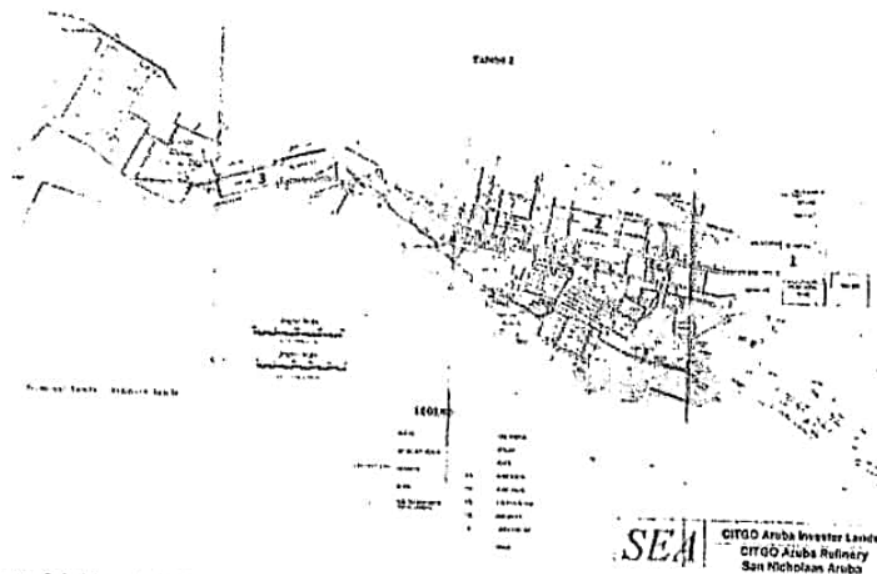


Figure 9.1: Map of CITGO Aruba with three locations for landfilling or other solid waste management options.

9.2.1.1 Location 1

The first location is a parcel of about 20 acres. This was a tank farm area in the early days of the refinery. The soil type is limestone. Due to the limestone it is difficult and costly to excavate therefore, stacking of solid waste could be considered. Another negative aspect is that this area is about 100 meters from residential area at the north boarding with Fortheuvelstraat.

Next to this area is an Asbestos landfill of the former Valero refinery, which some neighbors have filed a court case against the government of Aruba. Next to this site, there is a depot of isolation material, which the RDA is planning to landfill in the future. Next to this site, the RDA and CITGO reserved an area to landfill solid waste, which cannot be burned.

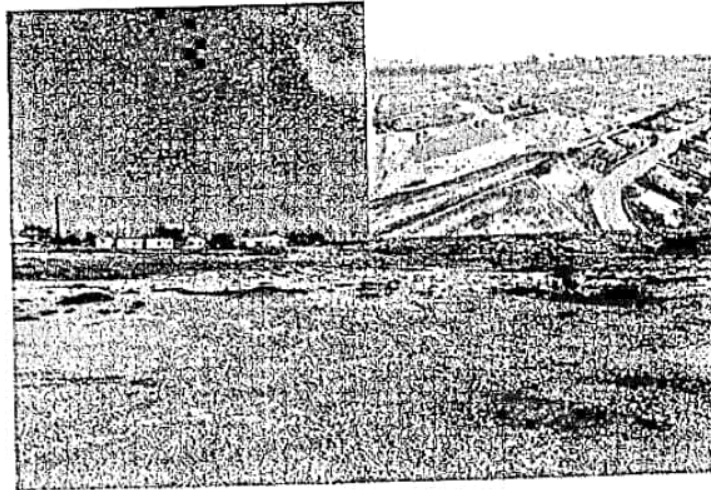


Figure 9.2: Houses at the Fortheuvelstraat boarding with the potential area.

9.2.1.2 Location 2

Location 2 is called the Laguna Negra area. This location is a contained area where residual of heavy oil has been dumped. The RDA has designated this area for the pilot project Bioplant (algae).

This location is reserved for future development by interested investors. This area contains much residual of heavy oil, which will be removed by the developers. This area is in the middle of RDA terrain.

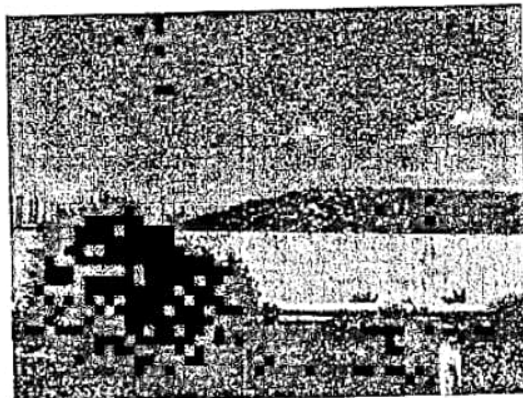


Figure 9.3 Laguna Negra

9.2.1.3 Location 3

Area with a lot of old metal (scrap) and old landfill material.

For future development of industrial zone, actually no longer for landfill.

The old landfill is located very close to the sea.

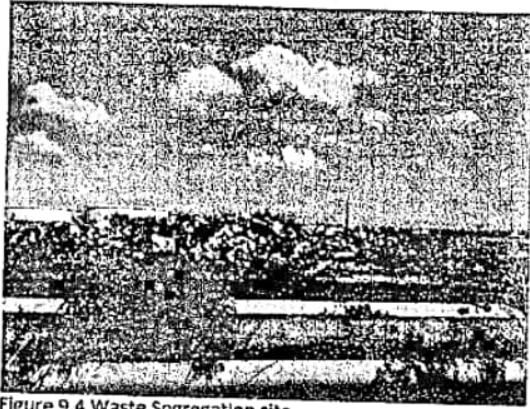


Figure 9.4 Waste Segregation site

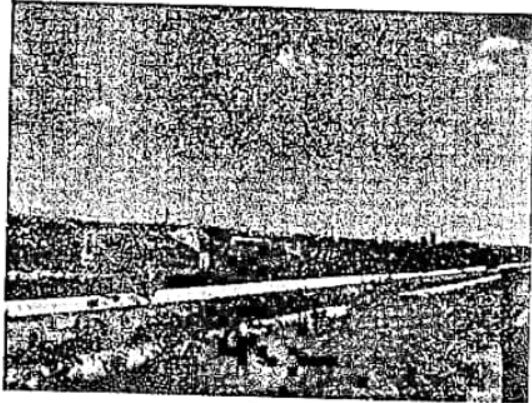


Figure 9.5 Waste Segregation site

1. Area 1 is a short distance residential area, visible, soil is limestone, outdoor; the plastic bails will be exposed to UV, plastic bails within a year, politically risky by NIMBY. This area is designated by RDA and Citgo as a landfill area.
2. Area 2 is located in the middle of the refinery industrial area called Laguna negra. Heavy oil deposits have been deposited in this area in the past. This area is designated by RDA as an extension area for the Algae nursery.

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3. Area 3 is a short distance from the Fire Department and is currently used for waste separation and waste incineration. Plastic bails can be stacked but in the open air, exposed to UV. This area was designated by RDA as a commercial expansion area for San Nicolas.

9.2.2 Johnsons Enterprises N.V.

Johnsons Enterprises presented four possible solutions:

- Rapid Alternative Solution
- Medical Waste Management
- Air curtain burners vs Wood grinders
- Report Pilot test: Burning of Serlimar Municipal solid waste

Air emission data available and certificated of approval of the box.

Ash has not been tested yet.

700 -1.000 kg/ week Bio-Hazardous waste. Initial Investment costs are 400.000 (US\$ of Euro?).

9.2.3 EcoGas N.V.

EcoGas gave a short PowerPoint presentation about the solutions that EcoGas has for the landfill at Parkietenbos.

EcoGas is ambitious and indicates that they can cope with this project, in other words that they want the entire waste disposal. Furthermore, they indicate that there is no competition with Serlimar because Serlimar can focus on chemical waste and waste from hospitals etc.

EcoGas also indicates that in consultation with the company they are able to do excavations and from their point of view invest in a win-win situation for all parties.

9.2.4 Utilities N.V.

The discussed points were illustrated through a detailed PowerPoint presentation:

- Work in progress.
- GoA = Government or Aruba initiated this project after, among other things, the crisis within the Serlimar.
- Approach waste processing.
- Important stakeholders have been identified and Utilities has had a meeting with them
- Cost plate. The government must realize that everything has a cost and that it must be calculated by calculating in time.
- It is emphasized that Land Aruba is the owner of the waste Parkietenbos. Serlimar gives the service.

Problem analysis:

- Smoke nuisance / air pollution
- Public health (emission of chemical vapors)
- Environmental pollution. (Leakage underground water flow towards the sea)
- Sorting-bailing-bagging equipment is ok.
- Gasification results are negative. High percentage of H₂S. WEB cannot process it.

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EcoGas is seen as a potential solution to the problem, but the negotiations are stuck. EcoGas wants all waste streams in order to create a more feasible solution and cover the additional investments, which is needed.

Suggestions: short-term solution. Nuisance reduction for the local residents.

In 2001-2004, ducts were installed for methane gas. Open air burners no optimal solution.

There is a company that offers suggestions not to do burners but incinerators that can process dirt more quickly.

Two companies. CAPEX 2.4 M and OPEX 4.1 M (burners) price per ton.

The presentation was eventually suspended given the time aspect. There was a misunderstanding about the amount of time for the presentation. Briefly speaking, we spoke about Burners as a temporary solution and about incinerators for the long term. The Utilities also presents an extensive report with multiple options and quotes from several companies and what it will cost.

Furthermore, in anticipation of the minister's decision, the right strategy will be determined.

Utilities has an extensive report of more than 3 cm thick and two USB sticks with information left for the workgroup.

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9.2.5 Directie Volksgezondheid (January 16, 2018)

Report Parkietenbos

The role of the Public Health Department in Waste Management

This report presents the waste management in Aruba and its implication in Public Health.

Dr. Wilmer Salazar, Mr. Anselmo Mathew, Mrs. Yvette Geerman, Mrs. Leslie Escobar

1/9/2018

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1. Introduction

Recently a working committee was established by Ministerial Decree of the Minister of Infrastructure and Environment. This multisector committee consist of a representative of the Ministry of Infrastructure and Environment as chairperson, The Director of the Department of Nature and Environment as secretary, Director of DQW, Director of Public Health.

The purpose for establishing this Committee in the broad sense is to study the waste management issues in Aruba and based on the results of the investigation, present a report with possible solutions on the short, middle and long term. Additionally, create a plan of action with a complete monitoring and evaluation scheme.

To be able to achieve this great task the Committee was divided into five Sub Committees. The Department of Public Health Is Involved In at least two Sub Committees.

Sub Committee 1 is in charge of studying possible solutions on a short- and medium term.

Sub Committee 2 is in charge of studying the possible options for the remediation of Parkietenbos.

Sub Committee 3 is in charge of studying and working on the legal framework for the proper waste management

Sub Committee 4 is in charge of the long-term solutions

Sub Committee 5 is in charge with the actualization of the report "Zero Tolerance"

2. The role of the Public Health Department

The role of the Department of Public Health in waste management regulation is to help make the process more sustainable while assuring the toxicological, infectious and hazardous risks to human health are minimal. Sustainable development is a development that meets the needs of the present without compromising the ability of future generations to meet their own newly adapted needs. Managing waste sites in a manner that minimizes toxic impacts on the current and future generations is obviously a crucial part in this. The management of waste facilities is extremely complex and requires an integrated approach including pollution prevention and control regime.

3. Waste problem in Aruba and its consequences for Public Health

The current problem with the Parkietenbos Waste Landfill, seen from a Public Health Perspective, is the fact that the smoke (e.g. toxic gases and bad odor) produced during the waste treatment process, negatively affects the health of the inhabitants of Simeon Antonio. Moreover, there is an imminent threat to human health due to the presence of excess insects and rodents on and around the landfill site, which become a Public Health concern.

The ongoing storage and decomposition of waste causes a problem that affects the surrounding communities of the Parkietenbos Waste Landfill. These conditions are favorable to the proliferation of rodents, microorganisms, toxic gases, etc. that directly and/or indirectly negatively affects human health. On the medium and long terms, these unfavorable conditions can contribute to the development of diseases (e.g. cancer, endocrine problems and bad congenital function).

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Previously, burning of waste was considered as the most effective method for waste management. Research today, has demonstrated that this method produces high concentrations of contaminants, potentially resulting in grave health and environmental problems. The increasing numbers of illegal waste sites on the island exacerbates the issues. There are International regulations regarding waste management (e.g. waste classification, separation, treatment and disposal).

Another aggravating factor that we should point out is the fact that the Parkietenbos Waste Landfill is situated in a residential area, is near the airport and is at the coast. International Environmental Norms regarding waste management should be applied. The FAO has for example established that the minimal distances of a waste landfill site to an airport, residential area or sea are as follows:

- a) 1. 500 m to 3000 Mt to the airport depending on the type of airplane and activities
- b) 1500 m to the residential areas
- c) 1000 m to the sea

Over the past 3 years, the Department of Public Health of Aruba has received complaints from the inhabitants near Parkietenbos Waste Landfill relating to the emission of toxic gases, the stench and the accumulation of flies. The Department of Public Health carried out numerous area inspections with no evidence of smoke. However, considering the complaints and the general knowledge of what has been happening in the surroundings on the landfill site, there is a strong indication that there are negative effects due to the emission of toxic gases.

First, the Department of Public Health recommended at least one air measurement to identify the toxic gases present. Once this result is reported, the Department of Public Health can proceed to establish the negative effects of the gases identified and develop a proper plan of action aimed at reducing the emission of such gases.

There are many international scientific studies and technical studies concerning the toxicity of contaminants that are emitted during waste management.

The increase in the population of and the number of visitors to Aruba over the last few years, has led to and the massive consumption of disposable products. For this reason, it has become imperative for Aruba to execute awareness campaigns concerning proper waste management.

4. Legal Framework

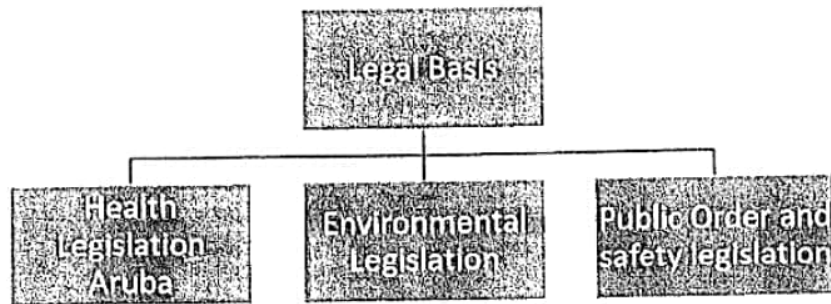
The Department of Public Health can positively contribute to the establishment of legislation concerning proper waste management through the development of guidelines and policies that minimize the risks to human health.

Currently, there is a significant lack of legislation and policies concerning waste management and disposal of infectious/ hazardous waste. This creates a challenge for the concerning Public Health and Environmental Health authorities when the necessary measures for protection need to be taken.

In Aruba there is for example no proper permit system in which the necessary requirements are established that a waste management plant need to comply with. Therefore, the group need to work together on the establishment of norms, spatial and chemical parameters and regulations. The completely waste management process, from the collection, storage and processing should be

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accordingly regulated, including awareness programs to the citizens about the waste problem. After which the monitoring process can be enforced to minimize possible health damage.



5. Conclusion

It is important for the government of Aruba to ensure that the applied waste management methods meet the national requirements on pollution control. Establish a legal framework in which the companies require authorization from the government and must comply with the regulations stipulated by the supervisory authority.

Periodically conduct sample tests to determine the human health risks involved with the waste management process. Develop the necessary documentation based on specific regulations, indicators and a complete monitoring and evaluation program.

6. recommendations

The Epidemiology & Research unit at the Department of Public Health in Aruba analyses medical data for various purposes (e.g. epidemiological, research, containment and preventive). This requires proper and timely notifications from the physicians. Unfortunately, Aruba does not have an effective notification system between the Department of Public Health and the Health Care system (e.g. general physicians, specialists and the Dr. HOH).

The National Ordinance on Contagious Diseases In Aruba contains a summary of the mandatory notifiable contagious diseases to the Department of Public Health. Subsequently, the Department of Public Health will take the necessary preventive- and containment measures.

The Department of Public Health recommends the creation of an adequate morbidity reporting and registration system. This system shall cover not only the mandatory notifiable contagious diseases but also other diseases that can pose a significant threat to public health, as this is not mandated in the current National Ordinance on Contagious Diseases In Aruba.

This can contribute substantially to the role of the Department of Public Health in monitoring and registering the incidence, distribution and possible control of diseases and other factors relating to human health. In conclusion, this shall enable the Department of Public Health to develop specific policies addressing the various health determinants.

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To summarize the following steps are highly recommended:

- Create a morbidity registry (of all diseases) to evaluate the behavior of diseases that may be related to pollution or accumulation of waste;
- Develop a surveillance and monitoring system of those diseases caused by pollution;
- Based on the data collected, establish the necessary management documentation and implement satisfactory preventive measures;
- Reduce the quantity of hazardous waste produced at Health Care services (e.g. Dr. HOH, Medical Laboratories, Pharmacies etc.) through the implementation of specific waste processing procedures such as sterilisation and incineration;
- Promote adequate and proper transportation and final handling of bio contaminated waste, thus minimizing the negative impact these can have on human health and environmental health;
- Measure the air quality of the area in and around the Parkietenbos Waste Landfill periodically;
- Design a digital morbidity registry system which will enable the Department of Public Health to do epidemiological data analysis on the morbidity and mortality of those diseases of interest;
- Perform an indepth analysis of the current Legal Framework on this matter, which will enhance any future collaboration between the proper authorities on waste management;
- Coordinate with the Pan American Health Organization to provide a representative who is an expert on waste management;
- Coordinate a meeting with the Dr. HOH and all other stakeholders within the Health Sector to dialogue on medical waste management.

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9.3 Matrix Pro's and Con's of the Solid Waste Management options

9.4 Pros and Cons of the options

The pros and cons were ultimately discussed for each of the four options considering the People, Planet, Profit (PPP) factors. An overview is shown in table 2.2 below of each option.

Table 9.1: Pros and cons of each short-term option.

Short-term options:	Pros:	Cons:
<p>1. Separation at EcoGas and Landfill bails at Sero Teishi and other quarries</p>	<p>People</p> <ul style="list-style-type: none"> - Residents of Parkietenbos will notice less activities for example less traffic, no landfilling/reduction of pollution, less smoke, noise reduction, less vectors. - Stop flow of waste, makes room to start restoration of the landfill <p>Prosperity</p> <ul style="list-style-type: none"> - Sero Teishi area can be made useful again for industrial development. ROP designated as economic zone - Low transportation costs <p>Planet</p> <ul style="list-style-type: none"> - Recyclables are separated, which diminishes the amount of waste to be further treated. - Sero Teishi area is designated as industrial zone. - WEB has a petition to develop this quarry into a solar panel park. - Only Serlimar and EcoGas can use this area. No other waste accepted at this location. Household and commercial waste have to be delivered at EcoGas. The remaining 	<p>People</p> <ul style="list-style-type: none"> - Some residents downwind of this area might experience nuisance, Not In My Backyard (NIMBY), uncertainty <p>Prosperity</p> <ul style="list-style-type: none"> - Some comments acknowledged that raising tax on landfills is part of the solution, but this cannot be done until cheap alternatives to landfills have been developed. - Sero Teishi area will be limited to industrial development, zoning option, limited to light development - Tipping fee will increase - Separation fee <p>Planet</p> <ul style="list-style-type: none"> - Soil is limestone. - Need a monitoring system - Not all waste streams are dealt with - Need sanitary landfill regulations and a management/operational plan - Risk of gas emissions (should be controlled) <p>Partnership</p>

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	<p>waste streams will be handled at Parkietenbos.</p> <p>Partnership</p> <ul style="list-style-type: none"> - Serlimar, EcoGas, WEB, DOW, DVG, PAHO, Johnson's, Land, DNM, ATIA, Stichting Parkietenbos 	<ul style="list-style-type: none"> - Needs alignment between the waste handlers.
<p>2. Separation at EcoGas and Open Air Burning of the RDF</p>	<p>People</p> <ul style="list-style-type: none"> - Residential area at a distance <p>Planet</p> <ul style="list-style-type: none"> - Recyclables are separated, which diminishes the amount of waste to be further treated. - Volume reduction <p>Partnership</p> <p>Serlimar, EcoGas, WEB, DOW, DVG, PAHO, Johnson's, Land, DNM, ATIA, Stichting Parkietenbos</p>	<p>People</p> <ul style="list-style-type: none"> - Perception of the residents of waste burning is negative due to environmental and health impacts <p>Prosperity</p> <ul style="list-style-type: none"> - Separation fee - Some comments acknowledged that raising tax on landfills is part of the solution, but this cannot be done until cheap alternatives to landfills have been developed. <p>Planet</p> <ul style="list-style-type: none"> - RDA area for Open Air Burning. - Does not handle all waste streams - No stake - Air emissions, - Ash need to be addressed <p>Partnership</p> <ul style="list-style-type: none"> - Needs alignment between the waste handlers. - Burning RDF in the open air causes air pollution.
<p>3. Separation at EcoGas and Open Air Burning with stacks</p>	<p>People</p> <ul style="list-style-type: none"> - Observe that some residents embrace this as 	<p>People</p> <ul style="list-style-type: none"> - Perception of some residents: this is not an integral solution, where

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	<p>an integral government solution.</p> <p>Planet</p> <ul style="list-style-type: none"> - Volume reduction; the sheer reduction in the space required to dispose of the waste relieves pressure on land, which in urban areas can constitute a big saving. - The amount of land clearing wastes burned can vary from year to year, usually depending on local building and development, and by how much of the material cleared is either sold or disposed of in some other manner. <p>Partnership</p> <ul style="list-style-type: none"> - Serlimar, DOW, DVG, PAHO, Johnson's, Land, DNM, ATIA, Stichting Parkietenbos, RDA 	<p>waste burning is negative due to environmental and health impacts and emission.</p> <ul style="list-style-type: none"> - Change in population, Changes in cost or location of landfills or other methods of waste disposal may change the emission that affect the open burning activities. <p>Prosperity</p> <ul style="list-style-type: none"> - Additional costs; some comments acknowledged that raising tax on landfills is part of the solution, but this cannot be done until cheap alternatives to landfills have been developed <p>Planet</p> <ul style="list-style-type: none"> - Need location. - Burning RDF in the open air causes air pollution, but a stack the transports the air emission further away. - Open burning emissions are also affected by combustion efficiency. Combustion efficiency is the proportion of the waste that is actually burned out of the total amount of waste that is subjected to burning. In a more detailed approach to estimating emissions, it may be appropriate to estimate combustion efficiency. - No environmental and economic benefit for recycling.
<p>4. Separation at EcoGas and packaged RDF Landfill at RDA</p>	<p>People</p>	<p>People</p>

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	<ul style="list-style-type: none"> - peace of mind for local neighbors <p>Prosperity</p> <ul style="list-style-type: none"> - Area 3 is designated as commercial development area. <p>Planet</p> <ul style="list-style-type: none"> - In a secured area. - Area 3 was a solid waste handling area. <p>Peace</p> <ul style="list-style-type: none"> - eventual instruction of Minister to use the 4 hectare of space at RDA <p>Partnership</p> <ul style="list-style-type: none"> - Serlimar, DOW, DVG, PAHO, Land, DNM, ATIA, San Nicolas neighbor, RDA 	<ul style="list-style-type: none"> - Area 1 is near Lago Heights/residential community. <p>Prosperity</p> <ul style="list-style-type: none"> - Some comments acknowledged that raising tax on landfills is part of the solution, but this cannot be done until cheap alternatives to landfills have been developed. - Need an agreement with RDA - High transportation costs. <p>Planet</p> <ul style="list-style-type: none"> - Relocation of problem. - Bottom is limestone. - Area 2 has an unknown amount of heavy oil in the enclosed area. - Clean up of the area that will be provided or offered.
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9.5 Waste Streams deposited at Parkietenbos per tons

	2012	2013	2014	2015	2012-2015	PERCENTAGE
HOUSEHOLD/SERLIMAR	40,838	39,792	37,676	34,655	38,240	30%
COMMERCIAL	6,871	6,722	30,264	28,210	18,017	14%
CONSTRUCT/DEMO	4,635	4,859			4,747	4%
SLUDGE RWZI	4,647	4,095	3,152	5,276	4,293	3%
SLUDGE HOTELS/REST	1,346	8,762	4,454		4,854	4%
SAND	372	3,080	309	13,668	4,357	3%
SHIP WASTE	39	141			90	0%
PLANT/YARD/DOW	2,321	3,353	13,304	7,802	6,695	5%
TIRES	590	596	42	275	376	0%
CART/PAPER	563	391	28	28	253	0%
CARWRECK	77	10	12	16	29	0%
MEDICWASTE	214	137			176	0%
GLASS	31	5			18	0%
ASBESTOS	116	136	46	270	142	0%
METAL	378	490	76	1,428	593	0%
PALLETWOOD	2,024	1,766	374	301	1,116	1%
FLUFF	140	0			70	0%
PLASTIC	12	2			7	0%
ECOTEC	29,456	28,327	81,982	41,781	45,387	36%
CLOTH	1	0			1	0%
E-WASTE		6			6	0%
CADAVERS/VET	143	140	134	125	136	0%
KITCHOIL	48	27			38	0%
MOTOROIL	27	27			27	0%
MISC.	52	742	207		334	0%
TOTAL	94,941	103,606	172,060	133,835	126,111	100%

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9.6 Text with draft proposal for solid waste management regulations
Bijlage I met de tekst van Hoofdstuk 4 van de ontwerp-Landsverordening milieubeheer

Hoofdstuk 4

Afvalstoffen

§ 4.1. Algemeen

Artikel 4.1

1. Het is verboden zich van afvalstoffen te ontdoen door deze, al dan niet in verpakking, buiten een inrichting te storten, anderszins op of in de bodem te brengen of te verbranden.

2. Bij of krachtens landsbesluit, houdende algemene maatregelen, kan, indien het belang van de bescherming van het milieu zich daartegen niet verzet, voor daarbij aangegeven categorieën van gevallen vrijstelling worden verleend van het verbod, bedoeld in het eerste lid, en kunnen regels worden gesteld over het zich ontdoen van afvalstoffen voor die categorieën van gevallen.

3. De Minister kan, indien het belang van de bescherming van het milieu zich daartegen niet verzet, ontheffing verlenen van het in het eerste lid, gestelde verbod om zich van afvalstoffen te ontdoen door deze buiten een inrichting te verbranden, voor zover het geen gevaarlijke afvalstoffen betreft.

Artikel 4.2

1. Het is verboden zonder vergunning van de minister bedrijfsmatig of in een omvang of op een wijze alsof deze bedrijfsmatig was, afvalstoffen in te zamelen of anderszins in ontvangst te nemen, te bewaren, nuttig toe te passen, te verwijderen, te vervoeren, te verhandelen of te bemiddelen

bij het beheer van afvalstoffen.

2. De artikelen 5.7 tot en met 5.25 zijn van overeenkomstige toepassing met betrekking tot het verlenen, weigeren, wijzigen en intrekken van een vergunning als bedoeld in het eerste lid, met dien verstande dat voor de toepassing van genoemde artikelen het belang van de bescherming van het milieu beperkt wordt tot het belang van een doelmatig beheer van afvalstoffen.

3. Ten aanzien van een beslissing omtrent een vergunning als bedoeld in het eerste lid houdt de Minister er rekening mee dat het belang van een doelmatig beheer van afvalstoffen voorts vereist dat:

- a. de continuïteit van het beheer van afvalstoffen wordt gewaarborgd;
- b. de capaciteit van de voorzieningen voor het beheer van afvalstoffen is afgestemd op het aanbod van afvalstoffen.

Artikel 4.3

1. Aan een vergunning als bedoeld in artikel 4.2 kunnen voorschriften worden verbonden.

2. De voorschriften kunnen in ieder geval inhouden:

- a. de verplichting de daarbij aangewezen afvalstoffen, wanneer zij aan de inzamelaar worden aangeboden, in ontvangst te nemen;
- b. de verplichting de daarbij aangewezen categorieën van afvalstoffen die gescheiden worden afgegeven, afzonderlijk in te zamelen;
- c. de verplichting de daarbij aangewezen afvalstoffen, wanneer zij aan de inzamelaar worden aangeboden, op te halen;
- d. de verplichting afvalstoffen af te geven aan de daarbij aangewezen personen.

3. Een vergunning geldt slechts voor degene aan wie zij is verleend.

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§ 4.2. Het beheer van gevaarlijke afvalstoffen, ingezamelde of afgegeven afvalstoffen of reststoffen die voortkomen uit de verbranding van afvalstoffen

Artikel 4.4

1. Het is verboden zich door afgifte aan een ander te ontdoen van gevaarlijke afvalstoffen, ingezamelde of afgegeven afvalstoffen of reststoffen die voortkomen uit de verbranding van afvalstoffen.

2. Het verbod, bedoeld in het eerste lid, geldt niet indien de afvalstoffen worden afgegeven aan een persoon:

- a. die over een vergunning als bedoeld in artikel 4.5 beschikt; of
- b. die bevoegd is de afvalstoffen nuttig toe te passen of te verwijderen op grond van een krachtens artikel 4.1, tweede lid, verleende vrijstelling.

3. Bij of krachtens landsbesluit, houdende algemene maatregelen, kunnen in het belang van de bescherming van het milieuregels worden gesteld omtrent het inzamelen en het beheer van de afvalstoffen, bedoeld in het eerste lid.

Artikel 4.5

1. Het is verboden zonder vergunning van de Minister afvalstoffen als bedoeld in artikel 4.4, eerste lid, in te zamelen, buiten een inrichting nuttig toe te passen of te verwijderen, voor anderen tegen vergoeding te vervoeren, te verhandelen of ten behoeve van anderen te bemiddelen bij het beheer van deze afvalstoffen.

2. Het verbod, bedoeld in het eerste lid, geldt niet voor een persoon als bedoeld in artikel 4.4, tweede lid.

3. De artikelen 5.8 tot en met 5.25 zijn van overeenkomstige toepassing met betrekking tot het verlenen, weigeren, wijzigen en intrekken van een vergunning als bedoeld in het eerste lid, met dien verstande

dat voor de toepassing van genoemde artikelen het belang van de bescherming van het milieu beperkt wordt tot het belang van een doelmatig beheer van afvalstoffen.

4. Ten aanzien van een beslissing omtrent een vergunning als bedoeld in het eerste lid houdt de Minister er rekening mee dat het belang van een doelmatig beheer van afvalstoffen voorts vereist dat:

- a. de continuïteit van het beheer van afvalstoffen wordt gewaarborgd;
- b. de capaciteit van de voorzieningen voor het beheer van afvalstoffen is afgestemd op het aanbod van afvalstoffen.

5. Bij of krachtens landsbesluit, houdende algemene maatregelen, kan, indien het belang van de bescherming van het milieu zich daartegen niet verzet, voor daarbij aangegeven categorieën van gevallen vrijstelling worden verleend van het verbod, bedoeld in het eerste lid.

Artikel 4.6

1. Aan een vergunning als bedoeld in artikel 4.5 kunnen voorschriften worden verbonden.

2. De voorschriften kunnen in ieder geval inhouden:

- a. de verplichting daarbij aangewezen afvalstoffen, wanneer zij aan de inzamelaar, bedoeld in artikel 4.4, eerste lid, worden aangeboden, in ontvangst te nemen;
- b. de verplichting daarbij aangewezen categorieën van afvalstoffen die gescheiden worden afgegeven, afzonderlijk in te zamelen;
- c. de verplichting daarbij aangewezen afvalstoffen, wanneer zij aan de inzamelaar worden aangeboden, op te halen;
- d. de verplichting afvalstoffen af te geven aan daarbij aangewezen personen.

3. Een vergunning geldt slechts voor degene aan wie zij is verleend.

Artikel 4.7

1. Degene die zich van gevaarlijke afvalstoffen, ingezamelde of afgegeven afvalstoffen of reststoffen die voortkomen uit de verbranding van afvalstoffen ontdoet, verstrekt:

- a. aan deze persoon een omschrijving van de aard, eigenschappen en samenstelling van de afvalstoffen;
- b. aan degene die opdracht heeft die afvalstoffen naar die persoon te vervoeren een begeleidingsbrief.

2. Bij ministeriële regeling worden regels gesteld over de begeleidingsbrief en de te registreren gegevens door degene die zich van de afvalstoffen ontdoet.

Artikel 4.8

1. Degene die afvalstoffen als bedoeld in artikel 4.4, eerste lid, vervoert, heeft een begeleidingsbrief als bedoeld in artikel 4.7, eerste lid, onderdeel b, behorende bij die afvalstoffen, bij zich, zolang hij die afvalstoffen onder zich heeft.

2. Hij geeft, indien een ander de afvalstoffen in ontvangst neemt, de begeleidingsbrief aan die ander af, bij de overdracht van die afvalstoffen.

3. Bij of krachtens landsbesluit, houdende algemene maatregelen, kunnen regels worden gesteld met betrekking tot de wijze waarop aan de verplichtingen, bedoeld in het eerste en tweede lid, uitvoering wordt gegeven. Tevens kunnen daarbij categorieën van gevallen worden aangewezen waarvoor zodanige verplichtingen niet gelden.

§4.3. Het grensoverschrijdend overbrengen van afvalstoffen

Artikel 4.9

1. Het is verboden gevaarlijke afvalstoffen, ingezamelde of afgegeven afvalstoffen of reststoffen die voortkomen uit de verbranding van afvalstoffen over te brengen:

- a. van Aruba naar staten die geen partij zijn bij het Verdrag van Bazel;
- b. naar Aruba uit staten die geen partij zijn bij het Verdrag van Bazel.

2. Het is verboden zonder vergunning van de Minister afvalstoffen als bedoeld in het eerste lid over te brengen:

- a. van of via Aruba naar staten die partij zijn bij het Verdrag van Bazel;
- b. van of via Aruba over het grondgebied van staten die partij zijn bij het Verdrag van Bazel.

3. Het is verboden zonder vergunning van het bevoegd gezag van de staat van herkomst en zonder verklaring van geen bezwaar van de Minister afvalstoffen als bedoeld in het eerste lid over te brengen.

4. Het is verboden afvalstoffen als bedoeld in het eerste lid over te brengen:

- a. zonder de begeleidingsbrief, bedoeld in artikel 4.7, tweede lid,
- b. indien die afvalstoffen niet wezenlijk in overeenstemming zijn met de begeleidingsbrief of het document, bedoeld in artikel 4.11, tweede lid.

5. Het is verboden afvalstoffen als bedoeld in het tweede lid over te brengen naar het gebied ten zuiden van zestig graden zuiderbreedte.

Artikel 4.10

1. Degene die afvalstoffen overbrengt als bedoeld in artikel 4.9, tweede en derde lid, stelt voor deze overbrenging financiële zekerheid.

2. Bij ministeriële regeling worden regels gesteld over het soort en de hoogte van de financiële zekerheid.

Artikel 4.11

1. Een aanvraag om een vergunning krachtens artikel 4.9, tweede lid, wordt ingediend door de houder van de afvalstoffen.
2. Een aanvraag wordt ingediend met gebruikmaking van een bij ministeriële regeling vastgesteld document.
3. Bij of krachtens landsbesluit, houdende algemene maatregelen, worden regels gesteld met betrekking tot de eisen waaraan de aanvraag, bedoeld in het eerste lid, moet voldoen.

Artikel 4.12

1. Na ontvangst van de aanvraag zendt de Minister een afschrift van het document, bedoeld in artikel 4.11, tweede lid, door aan het bevoegd gezag van de staat van bestemming en, indien van toepassing, het bevoegd gezag van de staat of staten van doorvoer.
2. De Minister besluit binnen tien weken na ontvangst van de aanvraag.
3. De verklaring van geen bezwaar van het bevoegd gezag van de staat van doorvoer wordt geacht te zijn verleend, indien het besluit van het bevoegd gezag van de staat van doorvoer omtrent de verklaring van geen bezwaar niet binnen zestig dagen na het tijdstip van verzending van het document is ontvangen.

Artikel 4.13

1. Een vergunning voor het overbrengen van afvalstoffen als bedoeld in artikel 4.9, tweede lid, wordt in ieder geval geweigerd, indien:
 - a. de houder geen financiële zekerheid als bedoeld in artikel 4.10, heeft gesteld;

- b. de staat van bestemming krachtens wetgeving iedere invoer van de afvalstoffen heeft verboden;
- c. het bevoegd gezag van de staat van bestemming of het bevoegd gezag van de staat van doorvoer bezwaar heeft gemaakt tegen de overbrenging;
- d. geen verklaring van geen bezwaar van het bevoegd gezag van de staat van bestemming is ontvangen;
- e. geen verklaring van geen bezwaar van het bevoegd gezag van de staat van doorvoer is ontvangen, tenzij dat bevoegd gezag aan de Minister heeft aangegeven geen verklaring van geen bezwaar vooraf te eisen of indien artikel 4.12, derde lid van toepassing is;
- f. geen schriftelijke verklaring kan worden overgelegd, waarbij de ontvanger zich bereid toont de afvalstoffen in ontvangst te nemen;
- g. wettelijke voorschriften inzake het beheer of vervoer van de afvalstoffen zich tegen de overbrenging verzetten;
- h. De Minister van oordeel is dat de afvalstoffen in de staat van bestemming niet op een milieuhygiënisch verantwoorde wijze zullen worden beheerd;
- i. het overbrengen van de afvalstoffen onnodige risico's voor de openbare veiligheid en het milieu met zich meebrengt.

2. Aan de vergunning kunnen in het belang van de bescherming van het milieuvoorschriften worden verbonden.

Artikel 4.14

1. De vergunning, bedoeld in artikel 4.9, tweede lid, onder a, kan worden verleend voor meerdere overbrengingen van afvalstoffen, indien:
- a. de afvalstoffen die worden overgebracht, dezelfde fysische en chemische eigenschappen bezitten;
 - b. de afvalstoffen worden overgebracht naar dezelfde ontvanger;

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c. de afvalstoffen worden overgebracht langs dezelfde douanekantoren van het Koninkrijk der Nederlanden, de staat van bestemming en de staat van doorvoer, en
d. het bevoegd gezag van de staat van bestemming een verklaring van geen bezwaar heeft afgegeven voor de overbrengingen.

2. De vergunning wordt voor ten hoogste twaalf maanden verleend.

Artikel 4.15

1. Indien het bevoegd gezag van de staat van herkomst een verklaring van geen bezwaar vraagt aan de Minister voor het overbrengen van afvalstoffen als bedoeld in artikel 4.9, eerste lid, besluit de Minister binnen dertig dagen na ontvangst van de aanvraag op het verzoek.

2. De verklaring van geen bezwaar voor het overbrengen van de afvalstoffen wordt geweigerd, indien:

a. de houder geen financiële zekerheid als bedoeld in artikel 4.10, heeft gesteld;

b. geen schriftelijke verklaring kan worden overgelegd, waarbij de ontvanger zich bereid toont die stoffen in ontvangst te nemen;

c. de ontvanger niet een persoon is als bedoeld in artikel 4.4, tweede lid;

d. wettelijke voorschriften inzake het beheer of vervoer van de afvalstoffen zich tegen de overbrenging verzetten;

e. het overbrengen van de afvalstoffen onnodige risico's voor de openbare veiligheid en het milieu met zich meebrengt.

3. Aan de verklaring van geen bezwaar kunnen in het belang van de bescherming van het milieuvoorschriften worden verbonden.

Artikel 4.16

1. Indien het bevoegd gezag van de staat van herkomst of het bevoegd gezag van de staat van doorvoer een verklaring van geen bezwaar vraagt aan de Minister voor het overbrengen van afvalstoffen als bedoeld in artikel 4.9, eerste lid, via het Land naar de staat van bestemming, is artikel 4.15, eerste lid, tweede lid, onder a, b, d en e, en derde lid van overeenkomstige toepassing.

2. De verklaring van geen bezwaar wordt tevens geweigerd, indien de ontvanger niet een persoon is als bedoeld in artikel 4.4, tweede lid, of een persoon is die in de staat van herkomst of de staat van doorvoer bevoegd is afvalstoffen over te brengen.

3. De verklaring van geen bezwaar wordt geacht te zijn verleend, indien het besluit van de Minister omtrent de verklaring van geen bezwaar niet binnen zestig dagen is ontvangen door het bevoegd gezag van de staat van herkomst of het bevoegd gezag van de staat van doorvoer.

Artikel 4.17

De ontvanger van de afvalstoffen stelt na de overbrenging, bedoeld in artikel 4.9, derde lid, het bevoegd gezag van de staat van herkomst en degene die de afvalstoffen uit de staat van herkomst heeft overgebracht, op de hoogte van de ontvangst van die afvalstoffen en van het tijdstip waarop die afvalstoffen nuttig zijn toegepast of zijn verwijderd.

Artikel 4.18

1. Indien de Minister van het bevoegd gezag van de staat van doorvoer of het bevoegd gezag van de staat van bestemming de mededeling krijgt dat de overbrenging van de afvalstoffen, bedoeld in artikel 4.9, tweede lid, onder a, de nuttige toepassing of de verwijdering niet volgens de vergunning of de voorwaarden van die vergunning, zal

plaatsvinden, stelt hij degene die de afvalstoffen uit Aruba heeft overgebracht, hiervan op de hoogte.

2. Indien het eerste lid van toepassing is, brengt degene die de afvalstoffen heeft overgebracht deze afvalstoffen binnen negentig dagen na de mededeling terug.

3. De plicht tot terugname, bedoeld in het tweede lid, geldt niet indien degene die de afvalstoffen heeft overgebracht, de Minister, het bevoegd gezag van de staat van bestemming en, indien van toepassing, het bevoegd gezag van de staat of staten van doorvoer overeenkomen dat de afvalstoffen elders zullen worden verwijderd of nuttig zullen worden toegepast.

4. De artikelen 4.15 en 4.16 zijn niet van toepassing op de overbrenging, bedoeld in het tweede lid.

§ 4.4. Afvalwater

Artikel 4.19

1. Bij of krachtens landsbesluit, houdende algemene maatregelen, kunnen regels worden gesteld met betrekking tot afvalwater teneinde nadelige gevolgen voor het milieu door afvalwater te voorkomen of zoveel mogelijk te beperken. Dit landsbesluit, houdende algemene maatregelen, kan een verbod om afvalwater in de bodem, openbare wateren en zee te lozen, bevatten.

2. Het landsbesluit, bedoeld in het eerste lid, voorziet tenminste in:

- a. maatregelen om het ontstaan van afvalwater te voorkomen of beperken;
- b. maatregelen waardoor de verontreiniging van afvalwater wordt voorkomen of beperkt;
- c. maatregelen om de afvalwaterstromen zoveel mogelijk gescheiden te houden;
- d. voorschriften betreffende het lozen van afvalwater in de riolering en in de bodem;

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- e. voorschriften ter bescherming van de riolering;
- f. maatregelen ter uitvoering van bijlage III bij het LBS-protocol.

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9.7 Text with draft proposal for solid waste management regulations
Bijlage II met de bepalingen van de ontwerp-Landsverordening milieubeheer houdende aanpassing van de APV

§ 9.3 Wijziging Algemene Politieverordening

Artikel 9.11

De Algemene Politieverordening (AB 1995 GT 8) wordt gewijzigd als volgt:

A. aan artikel 1 worden de volgende begripsbepalingen toegevoegd, luidende:

afvalstoffen: afvalstoffen als bedoeld in de Landsverordening milieubeheer (AB ...);

beerput: een put die niet in vakken is verdeeld waarin menselijke uitwerpselen van één of meer toiletten worden verzameld waarbij géén reiniging plaatsvindt;

nuttige toepassing: nuttige toepassing als bedoeld in de Landsverordening Milieubeheer;

beheer van afvalstoffen: beheer van afvalstoffen als bedoeld in de Landsverordening Milieubeheer;

ter inzameling aanbieden: de wijze van overdragen van afvalstoffen aan een beherende persoon of instantie, inclusief het achterlaten van afvalstoffen in daartoe door of vanwege de beherende persoon of instantie geplaatste inzamelmiddelen of voorzieningen of op een daartoe aangewezen plaats, waarbij de daadwerkelijke overdracht plaatsvindt op het moment dat de afvalstoffen in het inzamelmiddel of -voorziening zijn aangebracht;

inzamelmiddel: een voor de inzameling van afvalstoffen bestemd hulp- of bewaarmiddel, ten behoeve van één huishouden of één bedrijf;

inzameldienst: de op grond van artikel 2, eerste lid, van de Landsverordening instelling Servicio di Limpiesa di

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Aruba aangewezen instelling of een andere, door de Minister als inzameldienst erkende instelling, belast met de inzameling van afvalstoffen of categorieën van afvalstoffen.

B. in het opschrift van hoofdstuk II wordt na de woorden "openbare orde," ingevoegd de woorden: de zorg voor het milieu,

C. in hoofdstuk II wordt na § 1 een § 1a ingevoegd, luidende:

§ 1a. De zorg voor het milieu

Artikel 14f

1. Eenieder neemt voldoende zorg voor het milieu in acht.

2. De zorg houdt in ieder geval in dat een ieder die weet of redelijkerwijs kan vermoeden dat door zijn handelen of nalaten nadelige gevolgen voor het milieu kunnen worden veroorzaakt, verplicht is dergelijk handelen achterwege te laten voor zover zulks in redelijkheid kan worden gevergd, dan wel alle maatregelen te nemen die redelijkerwijs van hem kunnen worden gevergd teneinde die gevolgen te voorkomen of, voor zover die gevolgen niet kunnen worden voorkomen, deze zoveel mogelijk te beperken of ongedaan te maken.

Artikel 14g

Het is in de openbare ruimte verboden afval, enig voorwerp of enige stof te plaatsen, te storten, te werpen, uit te gieten, te laten lopen of vallen, of te houden, anders dan in een daartoe aangebracht of geplaatst publiek inzamelmiddel.

artikel 14h

Degene die in de openbare ruimte reclamebiljetten of dergelijke of ander promotiemateriaal onder het publiek verspreidt of laat verspreiden, is verplicht deze of de verpakking daarvan terstond op te ruimen of te laten opruimen, indien deze in de omgeving van de plaats van uitreiking op de weg of een andere voor het publiek toegankelijke plaats door het publiek worden weggeworpen.

§ 1b. Stortplaatsen en rioolwaterzuiveringsinstallaties

artikel 14i

1. De minister kan openbare stortplaatsen en rioolwaterzuiveringsinstallaties aanwijzen.
2. Bij landsbesluit, houdende algemene maatregelen, worden maatregelen over de inrichting van de stortplaats en rioolwaterzuiveringsinstallatie gesteld ter bescherming van het milieu, over het beheer van de stortplaats en rioolwaterzuiveringsinstallatie en maatregelen bij sluiting van de stortplaats.
3. De minister maakt de aanwijzing van openbare stortplaatsen en rioolwaterzuiveringsinstallaties bekend in de Landscourant.

D. in artikel 17, onderdeel b, wordt "afval" vervangen door:
afvalstoffen. ;

E. aan artikel 26 wordt een lid toegevoegd, luidende:

3. Aan de vergunning, bedoeld in het eerste lid, kunnen voorschriften worden verbonden, die nodig zijn om geluidsoverlast te voorkomen dan wel zoveel mogelijk te beperken, en voorschriften die nodig zijn om het ontstaan van afval te voorkomen, dan wel, zoveel mogelijk te

beperken, en het ontstane afval te verwijderen.

F. in artikel 28 worden de navolgende wijzigingen aangebracht:

1°. de onderdelen a, b en f vervallen.

2°. de onderdelen c, d en e worden geletterd tot de onderdelen a, b en c.

G. artikel 29 vervalt.

H. § 8 komt te luiden:

§8. Afvalstoffen

§8.1 algemeen

Artikel 52a

1. Eenieder die handelingen met betrekking tot afvalstoffen verricht of nalaat en die weet of redelijkerwijs had kunnen weten dat daardoor nadelige gevolgen voor het milieu ontstaan of kunnen ontstaan, is verplicht alle maatregelen te nemen of na te laten die redelijkerwijs van hem kunnen worden gevergd, teneinde die gevolgen zoveel mogelijk te voorkomen of te beperken.

2. Het is eenieder bij wie afvalstoffen ontstaan, verboden handelingen met betrekking tot die afvalstoffen te verrichten of na te laten, waarvan hij weet of redelijkerwijs had kunnen weten dat daardoor nadelige gevolgen voor het milieu ontstaan of kunnen ontstaan.

3. Het verbod, bedoeld in het tweede lid, geldt niet voor zover het handelingen betreft, die degenen die deze verricht, uitdrukkelijk zijn toegestaan bij of krachtens deze landsverordening of de Landsverordening milieubeheer.

Artikel 53

1. Het is verboden:

- a. afvalstoffen te bezigen tot het aanvullen of ophogen van erven of terreinen;
- b. afvalstoffen op erven of terreinen op te hopen, anders dan op stortplaatsen.

2. De minister kan ontheffing verlenen van het verbod in het eerste lid, onder a.

Artikel 54

Het is verboden de bij landsbesluit, houdende algemene maatregelen, aan te wijzen afvalstoffen te lozen in de riolering.

§8.2 Het aanbieden van vaste huishoudelijke- en bedrijfsafvalstoffen

Artikel 55

1. Eenieder is verplicht huishoudelijk afvalstoffen ter verwijdering aan te bieden overeenkomstig de bij of krachtens deze § gestelde regels.

2. Bedrijven zijn verplicht bedrijfsafvalstoffen aan te bieden ter verwijdering overeenkomstig bij of krachtens deze regels gestelde paragraaf, tenzij bij of krachtens de Landsverordening milieubeheer regels worden gesteld voor de verwijdering van de betreffende bedrijfsafvalstoffen.

Artikel 55a

1. Vaste huishoudelijke- en bedrijfsafvalstoffen worden bij het perceel ter inzameling aangeboden in een door een inzameldienst ter beschikking gesteld inzamelmiddel, waarbij voor verschillende categorieën van afvalstoffen per categorie een inzamelmiddel ter beschikking kan worden

gesteld. De periode waarin de huishoudelijke- en bedrijfsafvalstoffen kunnen worden aangeboden, wordt bij ministeriële regeling bepaald.

2. Het is verboden huishoudelijke- en bedrijfsafvalstoffen ter inzameling aan te bieden aan een ander dan de inzameldienst.

3. Het is anderen dan gebruikers van percelen verboden om huishoudelijke- en bedrijfsafvalstoffen ter inzameling aan te bieden.

4. Het is verboden afvalstoffen of inzamelmiddelen die ter inzameling gereed staan te doorzoeken en te verspreiden of te verplaatsen.

5. Indien voor verschillende categorieën van afvalstoffen een inzamelmiddel ter beschikking is gesteld, worden de categorieën van afvalstoffen afzonderlijk in het daartoe bestemde inzamelmiddel aangeboden.

Artikel 55b

Onder huishoudelijke afvalstoffen worden niet verstaan bedrijfsafvalstoffen, tuinafvalstoffen, grof huishoudelijke afvalstoffen welke niet aangeboden kunnen worden in het inzamelmiddel, bouw- en sloopafval, gevaarlijke afvalstoffen en autowrakken.

§8.3 Het aanbieden van afvalwater afkomstig van beerputten

Artikel 55c

1. Het is verboden afvalwater afkomstig uit een beerput te lozen in de bodem, openbare wateren of de zee.

2. Afvalwater uit een beerput wordt aangeboden aan een inzameldienst.

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§8.4 Aanbieden tuinafvalstoffen, grof huishoudelijke afvalstoffen welke niet aangeboden kunnen worden in het inzamelmiddel, bouw- en sloopafval, gevaarlijke afvalstoffen en autowrakken

artikel 55d

Eenieder is verplicht tuinafvalstoffen, grof huishoudelijke afvalstoffen welke niet aangeboden kunnen worden in het inzamelmiddel, bouw- en sloopafval, gevaarlijke afvalstoffen en autowrakken ter verwijdering aan te bieden overeenkomstig de bij of krachtens deze § gestelde regels.

artikel 55e

Grof huishoudelijke afvalstoffen, welke niet aangeboden kunnen worden in het inzamelmiddel, gevaarlijke afvalstoffen, asbesthoudende afvalstoffen, bouw- en sloopafvalstoffen, tuinafval, autowrakken worden alleen aangeboden op de wijze bij of krachtens landsbesluit, houdende algemene maatregelen, te bepalen regels.

I. in artikel 174a, eerste lid, wordt de zinsnede "de artikelen 16, 17, 28, 29, 53, 54 en 55 vervangen door: de artikelen 14f, 14g, 14h, 16, 17, 28, 52a, 53, 55, 55a, 55b, 55d, 55e en 55f.

J. in artikel 175, derde lid, wordt de zinsnede "de artikelen 16, 17, 28, 29, 53, 54 en 55 vervangen door: de artikelen 14f, 14g, 14h, 16, 17, 28, 52a, 53, 55, 55a, 55b, 55d, 55e en 55f.