

Procedure

Kriel Power Station

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Kriel Power Station

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1 Scope

1.1 Purpose

The purpose of this procedure is to prevent or reduce the discharge of waste to the environment by providing designated waste collection areas and containers and arranging for regular disposal throughout Kriel Power Station's jurisdiction. It is also to ensure that the employees of Kriel Power Station are aware of the waste being produced on site and which containers to use for the different waste in order to reduce/avoid mixing of waste.

1.2 Applicability

This procedure applies to all waste generated at Kriel Power Station including waste produced by contractors and waste produced at remote areas.

2 References

References to the following documents will enhance the understanding of the reader on the subject covered in this document. The requirements of these documents are, however, not an extension of this document.

- EPC Waste Management Procedure 32-245
- National Environmental Management Act (Act No.107 of 1998)
- National Environmental Management: Waste Act (Act No. 59 of 2008)
- DWAF's Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste, 1998
- SANS 290:2007 Mineral insulating oils Management and Handling of Polychlorinated Biphenyls (PCB)
- SANS 10248 Edition 2: 2004 Management of Healthcare Waste

3 Definitions and abbreviations

3.1 Definitions

- 3.1.1 **Waste** any substance, whether or not that substance can be reduced, re-used, recycled and recovered
- a) that is a surplus, unwanted, rejected, discarded, abandoned or disposed of
- b) which the generator has no further use of for the purpose of production
- c) that must be treated or disposed
- d) that is identified as waste by the Minister by notice in the Gazette

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- 3.1.2 **Hazardous waste** any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste have a detrimental impact on health and the environment.
- 3.1.3 **General waste** means waste that does not pose an immediate hazard or threat to health or to the environment, and includes—
- (a) domestic waste;
- (b) building and demolition waste;
- (c) business waste: and
- (d) inert waste;
- 3.1.4 E-Waste electronic waste
- 3.1.5 Health care risk waste waste capable of producing diseases
- 3.1.6 **Recycling** series of activities that includes the collection of recyclable materials that would otherwise be considered waste, the sorting and the processing of recyclables into raw materials such as fibres, and the manufacture of these raw materials into new products.

3.2 Abbreviations

3.2.1 KPS: Kriel Power Station

3.2.2 EMS: Environmental Management System

3.2.3 HOD: Head of Department

3.2.4 HCW: Health Care Waste

3.2.5 PCB: Polychlorinated biphenyls

3.2.6 DEA: Department of Environmental Affairs

3.2.7 DWA: Department of Water Affairs3.2.8 EMP: Environmental Management Plan3.2.9 PPE: Personal Protective Equipment

4 Procedure

4.1 Waste Management

- All waste generated at KPS including that generated by contractors and at remote areas shall be disposed of according to the waste management procedure. The procedure will ensure that all waste is disposed responsibly with due consideration for the environment, according to the applicable legislation and in a cost effective manner.
- KPS will follow the principle of elimination, reduction, recovery and recycling, while conserving energy, water and other natural resources wherever feasible.
- Waste Management Plan will be compiled

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4.1.1 Types of Waste produced at KPS

The management of the following types of waste will be covered in this procedure:

- General waste
- Fluorescent tubes and mercury containing devices
- Oil contaminated Waste e.g. oil contaminated rags and filters
- Used oil
- Asbestos waste
- Medical waste (Health care waste)
- Metals
- E-waste e.g. Scrap computers, Cartridges
- Solvents
- Polychlorinated biphenyls (PCBs)
- Garden refuse
- Sanitary waste
- · Sewage sludge and screen waste
- Building rubble
- Expired chemicals
- Waste food
- Paper

4.2 RESPONSIBILITIES FOR WASTE MANAGEMENT

4.2.1 Waste Separation/segregation

- Waste segregation is the responsibility of the waste generator and should be done
 at the source. This will enable the recycling of the different types of waste. To
 facilitate waste separation and recycling the KPS waste bins/skips colour coding
 has been developed. See Annexure 1
- OPS support Department is responsible for ensuring that bins, skips, drums and other waste receptacles are made available at KPS
- Line management shall be responsible for waste separation in their areas of responsibility
- Line management and/or the waste coordinator are responsible for communicating with the waste contract manager when the skips and bins are full and require removal
- The waste contract manager and /or environmental officer shall be responsible for communicating with the contractor for waste removal/recycling companies. The following types of waste will be recycled

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- -Scrap metal
- -Paper
- -Used oil
- -E-waste
- -Ash
- -Swirl/ waste food

4.2.2 Ordering of waste skips and waste bins

- The appointed waste contractor will deliver hazardous waste drums at the site and replace whenever they collect full drums.
- Skip requirements shall be identified by the KPS Station's waste coordinator who will request the required skips from the waste contract manager
- Skip required for outages shall be requested from the waste contract manager by line management a month prior to the outage. The quantities and skip types must be specified when the request is made.

4.2.3 Waste Handling Contractors

- Waste recycling and waste handling/transporting companies shall be contracted in writing and invoices retained as records.
- All waste handling and recycling companies should be registered and adhere to legal requirements before contracting them.
- The environmental officer shall be responsible for filing waste contractors' permits for record purposes.
- A call for service to the waste contractor shall be done by the waste contract
 manager or environmental officer whenever the skips require to be emptied.
- The waste contract manager/environmental officer shall prepare a waste removal schedule showing all the contractors and the waste they collect. The final disposal area and methods of treatment for each type of waste are shown in Annexure 2.
- All waste that is not part of the waste contract (price list of contract attached as Annexure 3) shall be the responsibility of the generating Department to dispose of and pay the disposal cost

4.2.4 Waste Monitoring and Reporting

- All departments producing waste should report the amount of waste generated or recycled and the income received if any by the last day of each month to the environmental officer
- Monthly reports shall be sent to Sustainability division: Waste Management by the environmental officer
- Waste Monitoring and reporting will be done as per EPC 32-245 Waste
 Management Procedure

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4.3 Non - hazardous waste

4.3.1 General Waste

- All general waste shall be disposed of in the white bins (and grey-concrete bins).
- The station cleaning supervisor and waste coordinator shall identify all areas where the domestic waste bins are required and make them available.
- Line management shall request for white bins from the waste contract manager if there is need for more bins in their areas.
- The waste disposal contractor shall dispose all the collected waste at the permitted landfill site.

4.3.2 Garden refuse

 All garden refuse shall be composted by the garden services contractor. The final use of such waste and quantities should be communicated to the Environmental Officer, by the Horticulturist

4.3.3 Metal Waste

- All scrap metals excluding copper shall be deposited into the scrap metals skips painted blue for collection by a scrap metal recycling contractor.
- Copper pieces shall be placed in the purple skip kept at Stores.
- The final use/disposal of such waste, quantities and income received if any should be communicated to the Environmental Officer

4.3.4 Building rubble

 All building rubble shall be placed in the brown skip and collected by the waste disposal contractor to a permitted landfill site.

4.3.5 Ash

- Ash from the station will be disposed of to the Ash dams while some will be recycled.
- Ash waste is measured in Kilo tonnes (kt) and is calculated from the coal burnt using the formula below:

Ash produced

Ash in Coal (%) x Coal Burn (tonnes)

= 100

= <u>Total</u>

1000

= kt

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• Ash waste figures will be reported to Sustainability Division: Waste management on a monthly basis.

4.3.6 Waste food

All waste food shall be collected from the canteen twice a week by a local farmer.
 This should be done in compliance to the Work Instruction named disposal of waste food and cooking oil from Kriel Power Station Canteen (RER 0208)

 The final use/disposal of such waste and monthly quantities should be communicated to the Environmental Officer

4. 4 Hazardous Waste

- Hazardous waste shall be disposed in a correct container and always separated as per Waste colour coding waste Containers in Kriel Power station
- During emergency situations where a specific waste type is not catered for in the Waste colour coding, available skips shall be used for that specific waste and labeled accordingly
- Storage sites will have an impermeable floor and bunding.
- Containers used shall be suitable for content and damaged containers shall be safely disposed of
- Hazardous Waste Removal Company will be contracted in writing by the environmental officer or responsible contract manager in liaison with the environmental officer with waste disposal duties specified.
- Transport operator shall use HAZCHEM placard and vehicles will be monitored by the responsible person from the department where the waste is collected.
- Safety data sheets of hazardous chemicals shall be made available at the hazardous waste storage area.

4.4.1 Fluorescent tubes and mercury containing devices

- All fluorescent tubes shall be handled and installed by the Electrical Maintenance Department.
- Waste fluorescent tubes that have been used shall be taken to the Fluorescent Tube Handling Area within the station.
- Used fluorescent tubes shall be crushed to reduce volume and minimize the waste.
- A trained operator shall be responsible for crushing the fluorescent tubes at the designated area with adequate ventilation.
- Appropriate equipment shall be used during crushing of fluorescent tubes.
- Crushed fluorescent tubes shall be treated with an equivalent amount of 50:50 sulphur and sodium sulphide before disposal.
- The appropriate respirator, gloves, work suit, full-face protection and safety shoes shall be worn by the operator at all times whilst performing his duties since fluorescent tubes contain mercury which is a bio-accumulative toxicant that can be easily absorbed through the skin, respiratory and gastro-internal tissues.
- The waste contract manager shall inform the hazardous waste transporter to come and collect the drums with crushed fluorescent tubes.
- The operator from EMD shall record the date and number of drums sent for

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disposal.

 The contractor shall dispose the fluorescent tubes at a registered hazardous waste disposal site.

4.4.2 Polychlorinated Biphenyls

- Equipment or containers that contain or come into contact with Mineral insulating
 oils containing PCBs must be labeled with visible, indelible markings in accordance
 with SANS 0290: Mineral insulating oils Management and Handling of
 Polychlorinated Biphenyls (PCB)
- A record of PCB contaminated equipment testing and inventory shall be kept
- Disposal shall be undertaken by disposal or decontamination facilities approved and licensed by DEA/ DWAF.
- PCB contaminated materials containing >500parts per million (ppm) is not permitted to be sold unless treated and the level come below the 50ppm

4.4.3 Used oil

- The department producing used oil shall place it in the drums and arrange for it to be taken to the oil recycling area for storage (as per work instruction Management of Oil Waste at Oil Recycling Area (MMM 0494) prior to being collected by the contractor.
- The drums shall be stored in a bunded area with impermeable flooring and/or in carrier provided by the contractor that will be placed in impermeable flooring.
- Operators shall put on safety shoes, work suit and oil impermeable gloves when handling oil waste.
- The oil recycling company shall collect the oil from the oil recycling area for recycling.
- All oil waste storage drums shall be tightly closed with fitting lids and stored in an upright position to prevent spillage of oil onto the floor.
- Drums shall be inspected for leaks prior to being filled with oil to avoid leakages.

4.4.4 Oil contaminated Waste

- Oil contaminated waste includes rags with oil, PPE contaminated with oil, oil filters and oil contaminated oil spill absorbents.
- The waste shall be placed in red skips by the department producing the waste and collected by the contractor for disposal.

4.4.5 E-waste

- All printer cartridges shall be collected by the Office Services department for refurbishment. The final use/disposal of such waste should be communicated to the Environmental Officer
- All waste computers, scanners and copiers shall be sent to stores for auctioning and a record of all computers sent to stores shall be kept at the IT department.

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4.4.6 Asbestos Waste

- Asbestos and asbestos containing materials including PPE that was used during asbestos stripping shall be placed in the yellow skips with lids.
- All used air filters from vacuum cleaners, air conditioners and ventilation equipment containing asbestos must be placed in impermeable bags and placed in the yellow skips.
- Waste removal contractor shall remove the asbestos waste on request and dispose it at a registered waste disposal site specifically designated for the purpose.
- Permit requirements for each site shall be adhered to.
- The waste contract manager is responsible for ensuring that the contractor concerned with collection, transport and disposal of asbestos waste is complying with the provisions of the Occupational Health and Safety Act, the National Road Transport Act, SANS 0228 and the relevant regulations.
- The Occupational Hygienist/asbestos stripping company shall inform the environmental officer of the quantity of asbestos that was stripped from the plant and disposed of into the skips.
- An Asbestos inventory shall be kept by the Occupational Hygienist and must be updated when an asbestos strip was done.
- The final disposal and maintaining of the records is the responsibility of the environmental officer.

4.4.7 Medical Waste

- General medical waste shall be separated from sharps/needles.
- HCW handlers shall be provided with the suitable protective clothing and equipment to perform their tasks.
- Sharp and liquid HCW (including swabs, bloodied bandages, etc.) must be stored in suitable bins that comply with SANS requirements.
- Infectious waste storage areas/bins must clearly display the international infectious hazard label and must be marked "Infectious Waste". Chemical or pharmaceutical waste storage areas/bins must display the appropriate international hazard labels and be marked "Chemical Waste".
- HCW waste should be packaged in appropriate containers according to SANS 10248 Edition 2: 2004 Management of healthcare waste, Section 7.3.
- Disposal of HCW shall be contracted to registered HCW transporters, transfer facilities and treatment facilities. The HCW disposal contract may only be entered into once the Environmental officer is satisfied that the waste management contractor has fully disclosed all its licensing and permit obligations and is adequately equipped for the activities proposed.

The HCW disposal contract must include at least the following:

- -Description of the volume and types of HCW to be collected for treatment And/or disposal.
- -The disposal and/or treatment process to be used.
 - -The method for calculating the numbers of different HCW units collected
 - -The verification of the physical condition of the HCW packages that are received.

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-A statement about the infection risks and other hazards of each package.

-The responsibility for the sorting, counting and collection of the HCW packages received.

Collection and transport

- The HCW disposal contract must stipulate the following regarding collection and transport:
 - -The categories of HCW to be collected
 - -The volume or mass of each waste category that may require treatment and/or disposal
 - -The collection schedule as negotiated between the waste management contractor and the KPS Clinic.
 - -Health and safety requirements, e.g. Personal Protective Equipment and immunisation
 - -Emergency procedures to be followed where normal collection and treatment/disposal procedures fail.
- The contractor must provide the following:
 - -Signatures of the responsible person at the KPS clinic upon collection of HCW
 - -The date and time of collection
 - -The amount and category of waste collected

Spillages

- The HCW disposal contract must stipulate the actions that should be taken in the event of an HCW spill.
- The waste management contractor must provide proof that it has the capacity and suitable equipment available in all instances to be able to handle an emergency spill of the categories of waste that is being handled.

Treatment and disposal

- The contractor must provide the following:
 - -Proof of final treatment or disposal of the HCW
 - -The treatment and/or disposal method for each individual waste category

4.4.8 Solvents

- Purchasing department shall ensure that all solvents purchased are delivered with a 16 point safety data sheet which is then passed on to the user of the solvent.
- All users of solvents must be trained in the purchase, storage, usage and disposal
 of solvents.
- Solvents shall be taken to the oil recycling area for disposal or recycling.

4.4.9 Sanitary waste

 All sanitary waste shall be placed in lined bins and the waste shall be collected two times a month.

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4.4.10 Sewage Sludge and sewage screen waste

- Sewage sludge and waste from the screens shall be collected by the waste contractor for disposal at a hazardous waste disposal facility.
- Sewage sludge and waste from the screens can be disposed at the municipal landfill site if the sewage is tested and found to be non –hazardous.
- Amount of sewage sludge and waste from screens disposed shall be forwarded to the environmental officer by the Chemical Services Department on a monthly basis.

5 Records

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6 Authorizations

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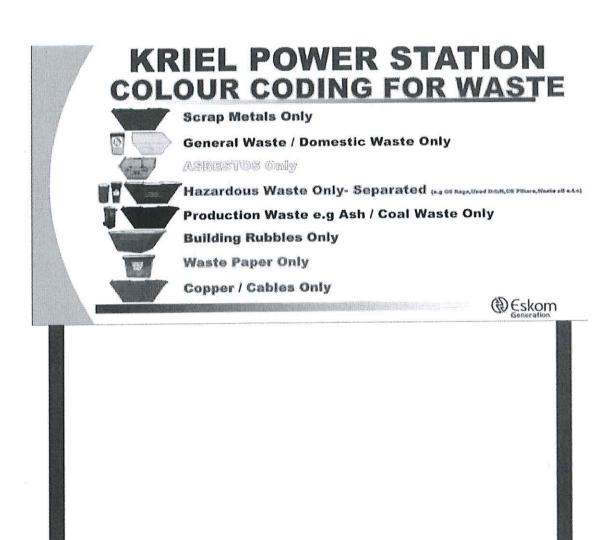
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9 Annexures

ANNEXURE 1: KRIEL POWER STATION COLOUR CODING FOR WASTE CONTAINERS



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ANNEXURE 2: Final disposal areas for Kriel Power Station's Waste

Type of Waste	Final Method of Disposal	Disposal Site		
Domestic waste	Co-disposed	Kriel landfill Site		
Fluorescent tubes and mercury containing devices	Treat with sodium sulphate & sulphur	Holfontein		
Oil contaminated Waste e.g. oil contaminated rags and filters	Co - Dispose	Holfontein		
Used oil	Recycled waste	Mpumalanga Oil		
Asbestos waste	Trench Cover Immediately	Plat kop/Holfontein		
Medical Waste (Health care waste)	De-Infect size by use of electrolyzing waste	Solid Waste Technologies		
Metals	Recycled waste	Highland Scrap Metal		
E-waste	Recycled	Mali's Transport cc		
Solvents	Ash blend 1:1	Holfontein		
Ozone depleting substances	Not on my scope	None		
Polychlorinated biphenyls (PCBs)	Ash Blend 10:1	Holfontein		
Sulphur hexafluoride gas (SF ₆) and by- products	Treat with Lime	Holfontein		
Garden refuse	Composted	Kriel power station		
Sanitary Waste	Treat with Lime	Holfontein		
Sewage Sludge and screen waste	Treat with lime	Roodepoort		
Building rubble	Co -Dispose	Middelburgh Landfill site		
Redundant chemicals	Burning	Thermo Powers		
Waste food	Recycled	PJ Ntuli (Farmer)		

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ANNEXURE 3: WASTE REMOVAL SCHEDULE

TYPE OF WASTE	WASTE CONTRACTOR	FREQUECY OF WASTE REMOVAL	CONTRACT MANAGER
Domestic waste	Roshcon	Once a Week	S. Ntshangase
Fluorescent tubes and mercury containing devices	Roshcon	When required	S. Ntshangase
Oil contaminated Waste e.g. oil contaminated rags and filters	Roshcon	When required	S. Ntshangase
Used oil Recycled	Mpumalanga oil	When required	Franse Mametsa
Asbestos waste	Roshcon	When required	S. Ntshangase
Medical Waste (Health care waste)	Roshcon	When required	S. Ntshangase
Metals (Recycling)	Zamani Scrap Metal	When Required	R. Maseko
E-waste		When required	O. Chiloane
Polychlorinated biphenyls (PCBs)	-	When required	A. Nqayana
Garden refuse	Ahaula	Daily	O. Chiloane
Sanitary Waste	L.S.G.M Trading (subcontracted Globetrotters)	Bi-Monthly	O. Chiloane
Sewage Sludge and screen waste	Roshcon	When required	S. Ntshangase
Building rubble	Roshcon	When required	S. Ntshangase
Redundant chemicals	Roshcon	When required	S. Ntshangase

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ANNEXURE 3: PRICE LIST OF CONTRACT

31. Oct. 2013 6:30

BUYING

No. 5702 P. 15

ESKOM HOLDINGS SOC LIMITED PROJECT AND CONTRACT TITLE CONTRACT NUMBER: 4600051314

C2.2 Price List

Item No.	Description	Unii	Gly	Rate	Amount
100	Removal of General Waste	·	-		Amount
101	Service general waste skips with	month	1100		
Estates	the compactor vehicle per service limited to 436m3 per collection		36	67,857.80	2,442,873.60
102	Rental: 6m3 skips for general waste	month	900	217,12	195,408.00
103	Rental; 6m3 skips for general waste - New additional skips	month	360	338.00	119,880,00
104	Additional waste over and above 438m3 per month for outages	m3	30,000.00	94.87	2,846,100.00
105	Removal of un-companiable building rubble - service done twice a month	Service	72	12,695.71	914,091.12
106	Establishment of additional skips for 3x skips per load	each	3	8,887.00	26,661.00
107	Monthly skip rental for brown building rubble skips	month	108	217.12	23,448.96
108	Establishment and De- establishment 3 x 28m3 skips from Jhb to Kriel with Roro track and traller	lrip	3	9,606.62	28,819.86
108	Rental of 3 x 28m3 per month	month	108	1,460.00	157,680,00
110	Collection and transport of 2 x 28m3 from Kriel to Kriel landfill site using Horo and trailer	lrip	150	11,919.50	1,787,925.00
111	Supply nets to cover all skips	Each	۵	848.82	0.00
200	Hazardous Waste Collection			445	-
201	Eslablishment of additional hazardous waste 5m3 closed skips from Jhb 4 skips per load	each	3	8,887.00	26,661.00
02	Monthly skip rental for hazardous waste closed skips	month	252	4G1,00	116,172.00
	Monthly skip rental for asbestos skips	month	72	696.00	50,112.00
	Collection and transport of loaded drum-carrier to Hollontein per load	each	0	10,935.67	0.00
05	Collection skip truck triple combination loads	trip	72	12,251.81	882,130.32
	Collection and transport using Hazmat LDV for the removal of 5x drums or medical waste per load	each	108	4,479,75	483,813.00
07	Supply of pressure lesied 210L drums	each	1200	190.00	228,000.00
08	Drum carrier rental per month	month	0	1,077.00	0.00

PART C2: PRICING DATA

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C2.2 ECSC3 PRICE LIST



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BUYING

No. 5702 P. 16

ESKOM HOLDINGS SOC LIMITED PROJECT AND CONTRACT TITLE

CONTRACT NUMBER: 4600051314

300	Hazardous Waste Disposal Cos		TI		η
301	Oll mixed with water				
302	Oil contaminated waste	210L	900	641.39	577,251.00
303	Oil contaminated waste	ton	760	1,335.38	1,001,535.00
304	Sewage waste	210L	0	471.58	0.00
305	Lime treatment (1bag per ton)	ton	720	1,462.43	1,052,949.60
306	Silica gel	each	720	170,44	122,716.80
307	Crushed fluorescent tubes	210L	72	641.39	46,180.08
308	Empty paint tins	210L	108	749.18	80,911.44
309	Emply washed broken lab boilles	ton	18	1,526.95	27,485.10
310	Redundant Chemical dispose at	210L	36	471.58	16,976.88
311	Inermo Power Technologies	kg	36	20.13	724.68
312	Sulphur	210L	72	641.39	46,180.08
313	Lime Irealment	each	72	170.44	12,271.68
314	Asbestos disposal	ton	330	743.83	
2011.00	COD Kits (must be empty and no liquids)	210L	36	20.13	245,463,90 724.68
315	Broken unwashed lab glasswere	210L	72		
316	Supply medical waste 7.61	7.6L Box	108	471.58	33,953.76
	containers	T.OL DOX	108	149.93	16,192.44
317	Supply medical waste 50L boxes	50L Box	108	14004	1
318	boxes boxes	each	60	148.64 56.41	16,053.12 3,364.60
319	Disposal of medical waste per KG	kg	100		A STATE OF THE STA
320	Waste Co-ordinator on site normal working hours	month	420 36	13.59 11,088.00	5,707.80 399,168.00
A					<u> </u>
100	Additional items				
101	Supervision	load	108	995.77	107 540 45
02	Lime treatment (1bag per ton)	each	720		107,543,16
03	Oil lillers	210L	120	170.44	122,716.80
04	Drizil and transformer oil	lon		471.58	0.00
05	Collection of samples for analysis	(7) TO 2 (1)	150	1,462.43	219,364.50
08		each	30	639.60	19,188.00
UB	Date sheet cost if there's no sample required	each	15	391.00	6,865.00
07	Sample analysis to determine the treatment method	each	30	889.00	26,670.00
OTAL AC	CHIEVED AMOUNT				
	THE TED AMOUNT		A second		14,536,953,96

Print Name	Signature	Dale		
		Q.		
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ANNEXURE 5: PCB-contaminated equipment testing and inventory

	Total number owned	Not tested	Teste	d/status	3		Numb er labell ed	Num ber not labell ed	Litres of PCB
			0 – 19 ppm	20 – 49 ppm	50 – 499 ppm	>500 ppm			
No of TFRs (HV yard & storag e, spares									
Litres of conta minate d oil (under status									
No pole- mount ed TFRs									
Litres of conta minate d oil (under status									

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6 PCB-contaminated equipment testing and inventory (cont.)

6 PCB-co	Total numb er owne d	Not teste d	Tested/status				Numb er labell ed	Num ber not labell ed	Litres of PCB
			0 – 19 ppm	20 – 49 ppm	50 – 499 ppm	>500 ppm			
No capacitors									
Litres of contamina ted oil (under status									
No NEC Litres of contamina ted oil (under status					# # # # # # # # # # # # # # # # # # #				
No VTs Litres of contamina ted oil (under status									
No CTs Litres of contamina ted oil (under status									
Other Litres of contamina ted oil (under status									
TOTAL VOLUME									

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