

**Monthly Performance Report  
(HWT-NG100-MPR-28-R0)**

**November 2018  
(From 01/11/2018 to 30/11/2018)**

**100 TPD Municipal Solid Waste (MSW) Facility  
Calangute, North Goa**

*Prepared By*  
**Hindustan Waste Treatment Pvt. Ltd.  
(HWT)**

*Submitted To*  
**Department of Science & Technology (DS&T)  
&  
Goa State Infrastructural Development  
Corporation Limited (GSIDC)**

**Table – 1**  
**Summary of Overall Average Results for November 2018**  
*(As compared to Schedule – 7: Performance Standards, Volume – I of RFP)*

Sr. No.	Parameter	Performance Standard As per Schedule – 7	Actual Performance at Plant (Monthly Average)
1.	Number of fractions of recyclables sorted per day from the input mixed waste	Minimum 10 numbers of fractions shall be sorted daily from the input dry waste as received in the facility. The list of fractions are as follows: 1. PET Bottles 2. Mixed Plastic Articles 3. Newspapers / other Paper Material 4. Cardboard 5. Styrofoam & Thermocol 6. Coconut Shells 7. Clothes 8. Rubber Articles 9. Metal Articles & Cans 10. E-waste Articles and any Hazardous Waste	<b>13 numbers</b> of fractions are being sorted daily from the input dry waste as received in the facility. The list of fractions are as follows: 1. Glass 2. Aluminum 3. Metal 4. Tetrapak 5. Paper / Cardboard 6. Mixed Plastic 7. Hard Plastics 8. PET Bottles 9. Styrofoam & Thermocol 10. Cloth / Rags / Textile 11. Leather / Rubber / Rexine 12. Coconut Shells 13. E-waste Articles and any Hazardous Waste
2.	Quantum of reject/residues to be sent to the landfill after processing. No organic fraction shall be disposed in the landfill.	Maximum 10% of inert of the total input waste as received in the facility (in TPD).	Input waste to the Plant is <b>154.83 TPD</b> . Quantum of Inert is <b>0.37 TPD</b> which is < <b>10%</b> of the Total Input Waste as received in the Facility.  No Organic Waste has been disposed in the Sanitary Landfill Facility.
3.	Electricity generation in the Plant	Minimum electricity to be generated in the plant shall be 0.40 MW per 100 tons of input wet biodegradable waste as received in the Facility (in TPD).	Electricity generation is <b>0.54 MW/100</b> tons of Input Biodegradable Waste as received in the Facility (in TPD).

Sr. No.	Parameter	Performance Standard As per Schedule – 7	Actual Performance at Plant (Monthly Average)										
4.	Biogas Flaring System	The Biogas Flaring System shall strictly be used only in case of emergency and not as a routine practice.	Biogas is being flared strictly, only under emergency and not as a routine practice. The average running time of Biogas Flaring System is <b>1.01 hours/day</b> .										
5.	Discharge of treated effluent conforming to regulatory norms	Effluent Treatment Plant shall be operated under all conditions.	Effluent Treatment Plant is being operated continuously and is meeting all statutory conditions. The Treated Effluent Characteristics are as follows: <table border="1" data-bbox="1036 730 1403 940"> <tbody> <tr> <td>pH</td> <td>6.98</td> </tr> <tr> <td>BOD</td> <td>7 mg/l</td> </tr> <tr> <td>COD</td> <td>74 mg/l</td> </tr> <tr> <td>TSS</td> <td>8 mg/l</td> </tr> <tr> <td>TDS</td> <td>1,689 mg/l</td> </tr> </tbody> </table>	pH	6.98	BOD	7 mg/l	COD	74 mg/l	TSS	8 mg/l	TDS	1,689 mg/l
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BOD	7 mg/l												
COD	74 mg/l												
TSS	8 mg/l												
TDS	1,689 mg/l												
6.	General Housekeeping, hygienic conditions, cleanliness, safety norms, adequate manpower, treatment methodology for plant operation & maintenance and storage conditions in the plant.	Minimum housekeeping, safety norms and cleanliness conditions shall be maintained at all times as per the Bid Document requirement.	<ul style="list-style-type: none"> <li>• High standard of Housekeeping, Cleanliness and Safety are being maintained at all times at the Plant.</li> <li>• Adequate manpower has been deployed in all shifts.</li> <li>• Also, the treatment methodology is being followed properly and proper storage conditions have been maintained in the Plant.</li> </ul>										

100 TPD Municipal Solid Waste (MSW) Facility at Calangute, North Goa

#	<b>Plant Performance Data: November 2018</b>		
Sr. No.	Content	Month	Signature
1	Input Waste Composition	From 01.11.2018 To 30.11.2018	
2	Recyclables		
3	Electricity Generation		
4	Biogas Flare		
5	Effluent Treatment Plant		
6	Inert		
7	Housekeeping		

100 TPD Municipal Solid Waste (MSW) Facility at Calangute, North Goa

**1 WASTE:**

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average		8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average		
<b>1A</b>	<b>Input Waste:</b>																				
1	Type 1: Dry Waste	TPD	72.28	63.54	61.78	60.42	82.32	61.75	67.48	67.08	49.61%	80.09	72.14	78.08	75.69	78.42	83.81	95.88	80.59	50.83%	
2	Type 2: Wet Waste	TPD	54.22	72.53	73.32	68.79	57.24	74.79	61.73	66.09	48.88%	77.86	78.63	75.89	63.13	91.31	88.38	60.41	76.52	48.26%	
3	Type 3: Mixed Waste	TPD	2.07	1.19	0.00	0.00	2.06	0.00	0.00	0.76	0.56%	0.00	0.00	0.00	0.00	1.44	0.00	0.00	0.21	0.13%	
4	Type 4: Tree Waste	TPD	1.47	1.85	1.37	0.53	2.10	0.45	1.20	1.28	0.95%	1.31	2.30	1.68	1.33	0.98	0.64	0.42	1.24	0.78%	
5	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>TPD</b>	<b>130.04</b>	<b>139.11</b>	<b>136.47</b>	<b>129.74</b>	<b>143.72</b>	<b>136.99</b>	<b>130.41</b>	<b>135.21</b>	<b>100.00%</b>	<b>159.26</b>	<b>153.07</b>	<b>155.65</b>	<b>140.15</b>	<b>172.15</b>	<b>172.83</b>	<b>156.71</b>	<b>158.55</b>	<b>100.00%</b>	

- # **Note:**  
 1 **Type-I: Dry Waste:** This has 25-30% Organic and 70-75% Inorganic.  
 2 **Type-II: Wet Waste:** This has 65-70% Organic and 30-35% Inorganic.  
 3 **Type-III: Mixed Waste:** This has 45-50% Organic and 50-55% Inorganic.

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average		8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average	
<b>1B</b>	<b>Output Products:</b>																			
1	Organic Fraction	TPD	59.66	68.41	65.25	65.67	60.77	66.15	60.02	63.70	47.11%	75.51	70.58	73.15	61.37	87.79	82.64	68.73	74.25	46.83%
2	Inorganic Fraction:																			
	Recyclables	TPD	8.90	10.16	10.02	9.41	10.48	10.25	9.55	9.82	7.27%	12.37	11.11	11.72	10.74	12.58	12.43	12.05	11.86	7.48%
	RDF	TPD	54.68	56.71	57.58	52.25	67.04	57.98	57.49	57.68	42.66%	67.83	67.25	66.84	64.79	67.09	74.40	73.03	68.75	43.36%
	Bulking Material	TPD	2.08	1.95	2.24	1.89	1.94	2.16	1.85	2.02	1.49%	2.24	1.82	2.26	1.92	2.55	2.72	2.49	2.29	1.44%
	Inert	TPD	3.25	0.03	0.00	0.00	1.39	0.00	0.30	0.71	0.53%	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.17	0.10%
3	Tree Waste	TPD	1.47	1.85	1.37	0.53	2.10	0.45	1.20	1.28	0.95%	1.31	2.30	1.68	1.33	0.98	0.64	0.42	1.24	0.78%
	<b>Total.....(1)+(2)+(3)</b>	<b>TPD</b>	<b>130.04</b>	<b>139.11</b>	<b>136.47</b>	<b>129.74</b>	<b>143.72</b>	<b>136.99</b>	<b>130.41</b>	<b>135.21</b>	<b>100.00%</b>	<b>159.26</b>	<b>153.07</b>	<b>155.65</b>	<b>140.15</b>	<b>172.15</b>	<b>172.83</b>	<b>156.71</b>	<b>158.55</b>	<b>100.00%</b>

**2 RECYCLABLES:**

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average		8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average	
1	Glass	Kg	154	192	162	142	212	150	194	172		221	226	154	167	171	241	234	202	
2	Aluminum	Kg	103	110	135	103	71	123	103	107		95	151	123	69	120	103	141	115	
3	Metal	Kg	206	220	243	258	269	273	194	238		269	226	277	250	342	276	313	279	
4	Tetra Pack	Kg	90	69	122	116	71	109	78	94		142	75	77	111	86	172	109	110	
5	Hard Plastic	Kg	180	275	162	181	241	150	258	207		221	151	169	236	274	172	266	213	
6	PET	Kg	180	192	270	181	283	246	258	230		269	226	308	194	223	189	281	241	
7	Mixed Plastic	Kg	7,856	8,963	8,836	8,321	9,234	9,080	8,373	8,666		11,025	9,981	10,470	9,648	11,280	11,158	10,581	10,592	
8	Thermocol + Styrofoam	Kg	129	137	95	103	99	123	90	111		126	75	139	69	86	121	125	106	
9	Cloth + Rags + Textiles	Kg	656	947	1,067	762	736	1,256	814	891		948	1,236	770	819	976	1,205	1,203	1,022	
10	Leather + Rexine + Rubber	Kg	1,093	810	1,054	1,021	751	696	1,085	930		1,485	844	1,139	1,069	1,438	1,360	1,547	1,269	
11	Paper + Cardboard	Kg	849	892	919	801	892	833	892	868		1,042	980	1,016	833	1,198	1,119	985	1,025	
12	Coconut	Kg	1,234	1,057	1,324	1,085	1,048	1,324	956	1,147		1,200	844	1,247	1,083	1,352	1,601	1,500	1,261	

- # **Note:**  
 1 Item No. 9 (Cloth + Rags + Textiles) and 10 (Leather + Rexine + Rubber) are sent to Cement Plants as RDF.  
 2 Item No. 11 (Paper + Cardboard) and 12 (Coconut) are used as Bulking Material in Composting.

**3 ELECTRICITY GENERATION:**

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average		8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average	
<b>3.1</b>	<b>Biogas Gensets:</b>																			
1	Biogas Genset-I: Running Time	hr	23.70	23.95	23.55	24.00	23.60	24.00	23.95	23.82		23.80	21.95	23.45	23.95	23.60	21.00	22.70	22.92	
2	Biogas Genset-I: Energy Generation	kW.hr	4,000	3,970	3,900	4,070	3,950	4,020	4,030	3,991		3,970	3,460	3,850	4,000	3,950	3,520	3,680	3,776	
3	Biogas Genset-II: Running Time	hr	23.70	24.00	23.65	24.00	23.60	24.00	23.95	23.84		23.75	22.00	23.40	23.95	23.60	23.10	23.80	23.37	
4	Biogas Genset-II: Energy Generation	kW.hr	3,940	3,920	3,840	4,010	3,870	3,980	3,890	3,921		3,830	3,350	3,760	3,850	3,790	3,790	3,830	3,743	
5	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>kW.hr</b>	<b>7,940</b>	<b>7,890</b>	<b>7,740</b>	<b>8,080</b>	<b>7,820</b>	<b>8,000</b>	<b>7,920</b>	<b>7,913</b>		<b>7,800</b>	<b>6,810</b>	<b>7,610</b>	<b>7,850</b>	<b>7,740</b>	<b>7,310</b>	<b>7,510</b>	<b>7,519</b>	

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3.2 Electricity Generation:																		
1	As per Tender: Minimum electricity to be generated in the plant shall be 0.4 MW per 100 tons of Input Biodegradable Waste as received in the Facility.	MW/100 MT	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2	Biodegradable Waste	TPD	59.66	68.41	65.25	65.67	60.77	66.15	60.02	63.70	75.51	70.58	73.15	61.37	87.79	82.64	68.73	74.25
3	Electricity Generation = $100 * \{(A2 \div A1) + (A4 \div A3)\} \div 1000 \div 18.1$	kW	335	329	328	337	331	333	331	332	328	310	325	328	328	332	323	325
4	Electricity Generation	MW/100 MT	0.56	0.55	0.55	0.56	0.55	0.56	0.55	0.55	0.55	0.52	0.54	0.55	0.55	0.55	0.54	0.54

4 BIOGAS FLARE:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	Operation Time	hr/day	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
5.1 Raw Effluent Quality:																		
1	Flow	m <sup>3</sup> /day	15.31	80.65	86.17	92.27	92.84	89.55	88.48	77.90	82.69	61.90	75.34	81.31	82.55	80.09	83.98	78.27
2	pH	---	7.45	6.95	6.27	6.15	7.92	6.73	6.09	6.79	7.37	7.00	7.90	6.10	6.57	6.45	7.35	6.96
3	Biochemical Oxygen Demand (BOD5)	mg/l	2,426	2,097	1,806	2,032	2,070	1,997	1,880	2,044	2,091	1,674	1,868	1,920	2,227	1,812	2,474	2,009
4	Chemical Oxygen Demand (COD)	mg/l	6,599	5,347	4,768	7,092	4,927	5,272	4,832	5,548	6,921	5,742	5,716	6,432	6,414	3,660	5,146	5,719
5	Total Suspended Solids (TSS)	mg/l	5,386	4,718	2,962	3,536	4,968	4,373	3,948	4,270	5,207	3,900	4,222	4,646	3,875	3,497	4,676	4,289
6	Total Dissolve Solids (TDS)	mg/l	1,619	1,319	1,569	1,342	1,624	1,670	1,734	1,554	1,435	1,616	1,534	1,319	1,694	1,577	1,797	1,567
5.2 Treated Effluent Quality:																		
1	pH	---	6.64	7.04	7.38	7.46	6.81	6.82	6.52	6.95	6.89	7.04	7.21	7.26	6.77	7.33	6.59	7.01
2	Biochemical Oxygen Demand (BOD5)	mg/l	7	7	9	6	9	8	6	7	6	7	7	6	5	6	7	6
3	Chemical Oxygen Demand (COD)	mg/l	84	71	75	81	84	74	61	76	76	86	80	82	70	67	64	75
4	Total Suspended Solids (TSS)	mg/l	8	8	10	7	10	9	7	8	7	8	8	7	6	7	8	7
5	Total Dissolve Solids (TDS)	mg/l	1,797	1,345	1,679	1,476	1,754	1,804	1,821	1,668	1,492	1,681	1,549	1,438	1,880	1,687	1,851	1,654

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	As per Tender: Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.																	
2	Input Waste	TPD	128.57	137.26	135.10	129.21	141.62	136.54	129.21	133.93	157.95	150.77	153.97	138.82	171.17	172.19	156.29	157.31
3	Inert Fraction	TPD	3.25	0.03	0.00	0.00	1.39	0.00	0.30	0.71	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.17
4	% of Total Input Waste.....(3) ÷ (2)	%	2.53%	0.02%	0.00%	0.00%	0.98%	0.00%	0.23%	0.54%	0.00%	0.00%	0.00%	0.00%	0.68%	0.00%	0.00%	0.10%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	1-Nov	2-Nov	3-Nov	4-Nov	5-Nov	6-Nov	7-Nov	Weekly Average	8-Nov	9-Nov	10-Nov	11-Nov	12-Nov	13-Nov	14-Nov	Weekly Average
1	Hygienic Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted

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**1 WASTE:**

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average		22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average	
<b>1A</b>	<b>Input Waste:</b>																			
1	Type 1: Dry Waste	TPD	87.22	81.22	87.27	79.10	86.39	85.44	96.08	86.10	54.63%	76.02	78.31	64.88	87.76	77.06	93.69	80.06	79.68	48.51%
2	Type 2: Wet Waste	TPD	66.16	84.37	60.65	67.80	79.32	72.69	63.60	70.66	44.83%	81.25	78.78	90.53	76.57	91.48	76.67	85.88	83.02	50.54%
3	Type 3: Mixed Waste	TPD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00%	0.00	0.00	0.00	0.00	1.91	0.00	0.00	0.27	0.17%
4	Type 4: Tree Waste	TPD	1.05	1.75	1.27	0.38	0.00	0.65	0.78	0.84	0.53%	0.83	1.38	2.51	1.07	0.45	1.35	1.49	1.30	0.79%
5	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>TPD</b>	<b>154.43</b>	<b>167.34</b>	<b>149.19</b>	<b>147.28</b>	<b>165.71</b>	<b>158.78</b>	<b>160.46</b>	<b>157.60</b>	<b>100.00%</b>	<b>158.10</b>	<b>158.47</b>	<b>157.92</b>	<b>165.40</b>	<b>170.90</b>	<b>171.71</b>	<b>167.43</b>	<b>164.28</b>	<b>100.00%</b>

- # **Note:**  
 1 **Type-I: Dry Waste:** This has 25-30% Organic and 70-75% Inorganic.  
 2 **Type-II: Wet Waste:** This has 65-70% Organic and 30-35% Inorganic.  
 3 **Type-III: Mixed Waste:** This has 45-50% Organic and 50-55% Inorganic.

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average		22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average	
<b>1B</b>	<b>Output Products:</b>																			
1	Organic Fraction	TPD	70.51	78.56	63.65	68.26	76.95	70.73	71.37	71.43	45.33%	76.66	73.77	80.72	76.63	85.80	80.06	82.73	79.48	48.38%
2	Inorganic Fraction:																			
	Recyclables	TPD	11.67	11.86	10.71	10.58	12.43	11.35	12.04	11.52	7.31%	12.33	10.92	12.03	12.18	13.01	12.71	11.43	12.09	7.36%
	RDF	TPD	68.84	72.71	70.65	66.21	74.31	74.23	73.64	71.51	45.38%	65.62	70.44	60.17	73.27	69.17	74.81	69.60	69.01	42.01%
	Bulking Material	TPD	2.36	2.47	2.10	1.85	2.02	1.82	2.63	2.18	1.38%	2.59	1.96	2.00	2.04	2.47	2.78	2.17	2.29	1.39%
	Inert	TPD	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.12	0.07%	0.07	0.00	0.49	0.22	0.00	0.00	0.00	0.11	0.07%
3	Tree Waste	TPD	1.05	1.75	1.27	0.38	0.00	0.65	0.78	0.84	0.53%	0.83	1.38	2.51	1.07	0.45	1.35	1.49	1.30	0.79%
	<b>Total.....(1)+(2)+(3)</b>	<b>TPD</b>	<b>154.43</b>	<b>167.34</b>	<b>149.19</b>	<b>147.28</b>	<b>165.71</b>	<b>158.78</b>	<b>160.46</b>	<b>157.60</b>	<b>100.00%</b>	<b>158.10</b>	<b>158.47</b>	<b>157.92</b>	<b>165.40</b>	<b>170.90</b>	<b>171.71</b>	<b>167.43</b>	<b>164.28</b>	<b>100.00%</b>

**2 RECYCLABLES:**

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average		22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average	
1	Glass	Kg	169	215	148	220	232	221	176	197		220	236	171	197	205	256	166	207	
2	Aluminum	Kg	92	132	74	103	166	95	128	113		142	157	155	99	153	153	149	144	
3	Metal	Kg	291	265	281	220	298	300	240	271		267	314	264	296	324	273	282	289	
4	Tetra Pack	Kg	153	166	74	118	149	79	144	126		110	79	155	115	119	102	166	121	
5	Hard Plastic	Kg	184	282	192	220	182	300	176	219		315	298	233	279	307	256	315	286	
6	PET	Kg	199	166	222	220	215	237	271	219		173	314	186	279	341	273	232	257	
7	Mixed Plastic	Kg	10,507	10,465	9,585	9,358	11,020	10,025	10,778	10,248		10,946	9,441	10,754	10,813	11,386	11,312	9,990	10,663	
8	Thermocol + Styrofoam	Kg	77	166	133	118	166	95	128	126		157	79	109	99	170	85	133	119	
9	Cloth + Rags + Textiles	Kg	1,120	845	1,257	1,307	1,475	1,123	1,086	1,173		1,101	848	870	822	1,602	1,397	1,062	1,100	
10	Leather + Rexine + Rubber	Kg	1,319	1,275	917	852	911	1,565	862	1,100		959	1,037	1,414	1,561	886	1,670	913	1,206	
11	Paper + Cardboard	Kg	982	1,060	902	970	1,077	965	1,038	999		1,085	958	1,041	986	1,057	1,193	1,095	1,059	
12	Coconut	Kg	1,380	1,408	1,198	881	945	854	1,597	1,180		1,510	1,005	964	1,052	1,415	1,584	1,079	1,230	

- # **Note:**  
 1 Item No. 9 (Cloth + Rags + Textiles) and 10 (Leather + Rexine + Rubber) are sent to Cement Plants as RDF.  
 2 Item No. 11 (Paper + Cardboard) and 12 (Coconut) are used as Bulking Material in Composting.

**3 ELECTRICITY GENERATION:**

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average		22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average	
<b>3.1</b>	<b>Biogas Gensets:</b>																			
1	Biogas Genset-I: Running Time	hr	24.00	23.50	20.70	24.00	23.70	21.85	23.15	22.99		23.70	18.15	22.15	23.35	24.00	23.65	24.00	22.71	
2	Biogas Genset-I: Energy Generation	kW.hr	3,720	3,670	3,000	3,360	3,210	3,220	3,810	3,427		3,940	2,980	3,420	3,810	4,010	3,940	4,050	3,736	
3	Biogas Genset-II: Running Time	hr	24.00	23.60	20.80	24.00	23.75	23.35	23.50	23.29		23.75	22.75	22.55	23.20	23.70	22.10	21.40	22.78	
4	Biogas Genset-II: Energy Generation	kW.hr	3,910	3,830	3,200	3,760	3,730	3,420	3,780	3,661		3,890	3,410	3,360	3,740	3,900	3,740	3,580	3,660	
5	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>kW.hr</b>	<b>7,630</b>	<b>7,500</b>	<b>6,200</b>	<b>7,120</b>	<b>6,940</b>	<b>6,640</b>	<b>7,590</b>	<b>7,089</b>		<b>7,830</b>	<b>6,390</b>	<b>6,780</b>	<b>7,550</b>	<b>7,910</b>	<b>7,680</b>	<b>7,630</b>	<b>7,396</b>	

100 TPD Municipal Solid Waste (MSW) Facility at Calangute, North Goa

3.2 Electricity Generation:																		
1	As per Tender: Minimum electricity to be generated in the plant shall be 0.4 MW per 100 tons of Input Biodegradable Waste as received in the Facility.	MW/100 MT	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
2	Biodegradable Waste	TPD	70.51	78.56	63.65	68.26	76.95	70.73	71.37	71.43	76.66	73.77	80.72	76.63	85.80	80.06	82.73	79.48
3	Electricity Generation = $100 * \{(A2 \div A1) + (A4 \div A3)\} \div 1000 \div 18.1$	kW	318	318	299	297	292	294	325	306	330	314	303	324	332	336	336	325
4	Electricity Generation	MW/100 MT	0.53	0.53	0.50	0.49	0.49	0.49	0.54	0.51	0.55	0.52	0.51	0.54	0.55	0.56	0.56	0.54

4 BIOGAS FLARE:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	Operation Time	hr/day	0.00	0.00	0.12	0.28	0.03	0.00	4.00	0.63	3.55	2.65	1.48	1.73	4.13	3.98	1.62	2.73

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
5.1 Raw Effluent Quality:																		
1	Flow	m <sup>3</sup> /day	84.29	83.94	80.91	77.08	76.70	65.35	65.26	76.22	45.03	49.65	53.46	88.25	88.84	78.11	86.88	70.03
2	pH	---	7.44	6.78	6.68	7.76	7.44	7.70	7.82	7.37	6.81	7.78	7.12	6.24	6.73	7.91	7.31	7.13
3	Biochemical Oxygen Demand (BOD5)	mg/l	2,148	1,572	1,862	1,991	1,613	2,184	2,255	1,946	2,182	1,530	2,453	2,103	2,361	2,224	2,118	2,139
4	Chemical Oxygen Demand (COD)	mg/l	6,315	3,443	4,469	5,216	3,565	5,154	5,840	4,857	6,284	3,335	5,470	7,255	4,958	5,271	5,592	5,452
5	Total Suspended Solids (TSS)	mg/l	5,220	3,899	4,227	4,719	2,516	3,800	4,533	4,131	3,928	3,106	5,029	4,648	4,391	4,426	3,558	4,155
6	Total Dissolve Solids (TDS)	mg/l	1,612	1,731	1,705	1,678	1,692	1,781	1,646	1,692	1,380	1,383	1,689	1,566	1,467	1,791	1,741	1,574
5.2 Treated Effluent Quality:																		
1	pH	---	7.43	6.96	6.66	6.58	6.64	6.76	7.36	6.91	6.87	7.05	7.19	7.44	7.03	6.67	7.46	7.10
2	Biochemical Oxygen Demand (BOD5)	mg/l	6	9	6	6	9	5	7	7	9	9	9	5	9	7	6	8
3	Chemical Oxygen Demand (COD)	mg/l	74	59	61	56	68	60	52	61	68	74	66	71	88	53	61	69
4	Total Suspended Solids (TSS)	mg/l	7	10	7	7	10	6	8	8	10	10	10	6	10	8	7	9
5	Total Dissolve Solids (TDS)	mg/l	1,709	1,800	1,790	1,762	1,709	1,870	1,778	1,774	1,408	1,424	1,875	1,629	1,584	1,970	1,863	1,679

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	As per Tender: Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.																	
2	Input Waste	TPD	153.38	165.59	147.92	146.90	165.71	158.13	159.68	156.76	157.27	157.09	155.41	164.33	170.45	170.36	165.94	162.98
3	Inert Fraction	TPD	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.12	0.07	0.00	0.49	0.22	0.00	0.00	0.00	0.11
4	% of Total Input Waste.....(3) ÷ (2)	%	0.00%	0.00%	0.55%	0.00%	0.00%	0.00%	0.00%	0.08%	0.04%	0.00%	0.32%	0.13%	0.00%	0.00%	0.00%	0.07%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	15-Nov	16-Nov	17-Nov	18-Nov	19-Nov	20-Nov	21-Nov	Weekly Average	22-Nov	23-Nov	24-Nov	25-Nov	26-Nov	27-Nov	28-Nov	Weekly Average
1	Hygienic Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted	Accepted



100 TPD Municipal Solid Waste (MSW) Facility at Calangute, North Goa

**1 WASTE:**

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average		Monthly Average	
<b>1A</b>	<b>Input Waste:</b>							
1	Type 1: Dry Waste	TPD	74.53	81.05	77.79	49.07%	78.25	50.53%
2	Type 2: Wet Waste	TPD	81.59	76.57	79.08	49.89%	75.07	48.48%
3	Type 3: Mixed Waste	TPD	0.00	0.00	0.00	0.00%	0.25	0.17%
4	Type 4: Tree Waste	TPD	1.35	1.94	1.65	1.04%	1.26	0.82%
<b>5</b>	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>TPD</b>	<b>157.47</b>	<b>159.56</b>	<b>158.52</b>	<b>100.00%</b>	<b>154.83</b>	<b>100.00%</b>

- # **Note:**
- Type-I: Dry Waste:** This has 25-30% Organic and 70-75% Inorganic.
  - Type-II: Wet Waste:** This has 65-70% Organic and 30-35% Inorganic.
  - Type-III: Mixed Waste:** This has 45-50% Organic and 50-55% Inorganic.

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average		Monthly Average	
<b>1B</b>	<b>Output Products:</b>							
1	Organic Fraction	TPD	78.85	72.12	75.49	47.62%	72.87	47.06%
2	Inorganic Fraction:							
	Recyclables	TPD	11.01	12.09	11.55	7.29%	11.37	7.34%
	RDF	TPD	64.41	69.62	67.01	42.27%	66.79	43.14%
	Bulking Material	TPD	1.86	2.33	2.10	1.32%	2.17	1.41%
	Inert	TPD	0.00	1.46	0.73	0.46%	0.37	0.25%
3	Tree Waste	TPD	1.35	1.94	1.65	1.04%	1.26	0.82%
	<b>Total.....(1)+(2)+(3)</b>	<b>TPD</b>	<b>157.47</b>	<b>159.56</b>	<b>158.52</b>	<b>100.00%</b>	<b>154.83</b>	<b>100.00%</b>

**2 RECYCLABLES:**

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average		Monthly Average	
1	Glass	Kg	203	189	196		195	
2	Aluminum	Kg	109	79	94		114	
3	Metal	Kg	265	236	251		265	
4	Tetra Pack	Kg	94	79	87		107	
5	Hard Plastic	Kg	203	173	188		223	
6	PET	Kg	250	268	259		241	
7	Mixed Plastic	Kg	9,742	10,970	10,356		10,105	
8	Thermocol + Styrofoam	Kg	141	95	118		116	
9	Cloth + Rags + Textiles	Kg	1,311	1,482	1,397		1,117	
10	Leather + Rexine + Rubber	Kg	1,030	1,072	1,051		1,111	
11	Paper + Cardboard	Kg	1,062	961	1,012		993	
12	Coconut	Kg	796	1,371	1,084		1,180	

- # **Note:**
- Item No. 9 (Cloth + Rags + Textiles) and 10 (Leather + Rexine + Rubber) are sent to Cement Plants as RDF.
  - Item No. 11 (Paper + Cardboard) and 12 (Coconut) are used as Bulking Material in Composting.

**3 ELECTRICITY GENERATION:**

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average		Monthly Average	
<b>3.1</b>	<b>Biogas Gensets:</b>							
1	Biogas Genset-I: Running Time	hr	24.00	24.00	24.00		23.29	
2	Biogas Genset-I: Energy Generation	kW.hr	4,010	4,030	4,020		3,790	
3	Biogas Genset-II: Running Time	hr	20.50	22.80	21.65		22.99	
4	Biogas Genset-II: Energy Generation	kW.hr	3,210	3,690	3,450		3,687	
<b>5</b>	<b>Total.....(1)+(2)+(3)+(4)</b>	<b>kW.hr</b>	<b>7,220</b>	<b>7,720</b>	<b>7,470</b>		<b>7,477</b>	

100 TPD Municipal Solid Waste (MSW) Facility at Calangute, North Goa

3.2 Electricity Generation:						
1	As per Tender: Minimum electricity to be generated in the plant shall be 0.4 MW per 100 tons of Input Biodegradable Waste as received in the Facility.	MW/100 MT	0.4	0.4	0.4	0.4
2	Biodegradable Waste	TPD	78.85	72.12	75.49	72.87
3	Electricity Generation = $100 * \{(A2 \div A1) + (A4 \div A3)\} \div 1000 \div 1B.1$	kW	324	330	327	323
4	Electricity Generation	MW/100 MT	0.54	0.55	0.55	0.54

4 BIOGAS FLARE:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	Operation Time	hr/day	3.37	0.00	1.69	1.01

5 EFFLUENT TREATMENT PLANT:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
5.1 Raw Effluent Quality:						
1	Flow	m <sup>3</sup> /day	87.53	88.05	87.79	78.04
2	pH	---	6.63	6.96	6.80	7.01
3	Biochemical Oxygen Demand (BOD5)	mg/l	1,669	2,125	1,897	2,007
4	Chemical Oxygen Demand (COD)	mg/l	3,472	6,120	4,796	5,274
5	Total Suspended Solids (TSS)	mg/l	2,837	4,144	3,491	4,067
6	Total Dissolve Solids (TDS)	mg/l	1,640	1,506	1,573	1,592
5.2 Treated Effluent Quality:						
1	pH	---	6.75	7.10	6.93	6.98
2	Biochemical Oxygen Demand (BOD5)	mg/l	5	6	6	7
3	Chemical Oxygen Demand (COD)	mg/l	91	86	89	74
4	Total Suspended Solids (TSS)	mg/l	6	7	7	8
5	Total Dissolve Solids (TDS)	mg/l	1,820	1,521	1,671	1,689

6 DISPOSAL OF INERT:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	As per Tender: Maximum 10% of Inerts of the Total Input Waste (excluding Mulched Tree Waste) as received in the Facility.					
2	Input Waste	TPD	156.12	157.62	156.87	153.57
3	Inert Fraction	TPD	0.00	1.46	0.73	0.37
4	% of Total Input Waste.....(3) ÷ (2)	%	0.00%	0.93%	0.46%	0.25%

7 HOUSEKEEPING:

Sr. No.	Description	Unit	29-Nov	30-Nov	Weekly Average	Monthly Average
1	Hygenic Conditions	---	Accepted	Accepted	Accepted	Accepted
2	Cleanliness	---	Accepted	Accepted	Accepted	Accepted
3	Manpower Deployed	---	Accepted	Accepted	Accepted	Accepted
4	Safety Norms	---	Accepted	Accepted	Accepted	Accepted
5	Treatment Methodology	---	Accepted	Accepted	Accepted	Accepted
6	Storage Conditions	---	Accepted	Accepted	Accepted	Accepted