

# Pollution Research Group

University of KwaZulu-Natal, Durban, South Africa

## Support to Sanitation Practitioners

Cost of laboratory analyses

**Fifth Edition: April 2018**

Fourth Edition: July 2017

Third edition: April 2017

Second edition: July 2016

Under a Bill & Melinda Gates Foundation Grant, the PRG is able to offer laboratory analyses at a discounted rate to other sanitation practitioners up until April 2020. In order to have samples analysed in the PRG laboratories, the sample analysis questionnaire should be completed, and the associated costs identified from the table below. Please contact the laboratory manager Merlien Reddy (Reddym5@ukzn.ac.za) with any queries.

**Full cost recovery** – includes consumables, overheads, capital and labour costs for undertaking the tests. If a visiting researcher is trained in using the equipment, training costs would also be added to this total.

**Discounted cost** – cost of consumables (chemicals, laboratory consumables, maintenance etc.). Where equipment was not funded through a Bill & Melinda Gates Foundation project, capital costs are also included.

<b>Chemical test</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Respirometric Tests	19,25	<b>231,03</b>	<b>43,53</b>	5,00	562,50
ASBR	2,50	<b>402,92</b>	<b>27,92</b>	1,00	337,50
VFA	0,50	<b>89,73</b>	<b>14,73</b>	30,00	337,50
pH and EC	0,50	<b>82,68</b>	<b>7,68</b>	30,00	200,00
COD	4,08	<b>68,16</b>	<b>36,91</b>	30,00	675,00
TKN	0,70	<b>119,06</b>	<b>43,44</b>	20,00	775,00
Ammonia	0,58	<b>110,73</b>	<b>23,23</b>	30,00	425,00
Total solids	0,28	<b>48,42</b>	<b>5,92</b>	36,00	350,00
Volatile solids	0,17	<b>32,92</b>	<b>7,92</b>	36,00	287,50
Total suspended solids	0,35	<b>64,37</b>	<b>11,87</b>	36,00	350,00
Total volatile suspended solids	0,17	<b>31,50</b>	<b>10,97</b>	36,00	287,50
<b>Spectroquant tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Total Phosphate	1,03	<b>146,42</b>	<b>66,42</b>	12,00	425,00
Soluble Phosphate	0,53	<b>119,46</b>	<b>39,46</b>	12,00	360,00
Nitrites	0,53	<b>149,38</b>	<b>69,38</b>	10,00	362,50
Nitrates	0,53	<b>147,31</b>	<b>67,31</b>	10,00	362,50
Total nitrogen	0,53	<b>177,53</b>	<b>97,53</b>	10,00	425,00
Sodium	0,53	<b>144,45</b>	<b>64,45</b>	10,00	362,50
Potassium	0,53	<b>145,97</b>	<b>65,97</b>	10,00	362,50
Ammonium	0,53	<b>112,96</b>	<b>32,96</b>	10,00	362,50
COD	0,53	<b>126,75</b>	<b>46,75</b>	10,00	362,50
TOC	0,53	<b>206,89</b>	<b>126,89</b>	10,00	350,00
Chlorides	0,53	<b>115,96</b>	<b>35,96</b>	10,00	350,00
Chlorides(chloride analyser)	0,25	<b>113,32</b>	<b>33,32</b>	10,00	350,00
Chlorine(total &free)	0,53	<b>107,31</b>	<b>27,31</b>	10,00	350,00
Alkalinity	0,53	<b>112,24</b>	<b>32,24</b>	10,00	350,00
<b>Lovibond tests-Field Tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Soluble Phosphate	0,45	<b>82,09</b>	<b>14,59</b>	10	200,00
Nitrates	0,45	<b>76,93</b>	<b>9,43</b>	10	200,00
Ammonia	0,45	<b>79,88</b>	<b>12,38</b>	10	200,00
Chlorine(total &free)	0,45	<b>75,80</b>	<b>8,30</b>	10	200,00
<b>Handheld-Field tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
pH and EC portable	0,42	<b>68,78</b>	<b>6,72</b>	10,00	200,00
Turbidity	0,25	<b>38,79</b>	<b>1,65</b>	10,00	200,00
DO	0,25	<b>43,80</b>	<b>6,30</b>	10,00	200,00
Color	0,20	<b>35,75</b>	<b>5,75</b>	10,00	200,00

<b>Photometer-Field tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Nitrates	0,45	87,97	20,47	10	200
DO	0,45	106,52	39,02	10	200
Chlorine(total &free)	0,45	87,42	19,92	10	200
<b>Mechanical tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Calorific value	1,23	131,02	31,02	15,00	387,50
TCI	1,05	89,80	17,30	30,00	375,00
Rheometer and viscosity	0,83	149,55	74,55	20,00	387,50
Penotrometer	0,33	117,97	67,97	20,00	175,00
Sludge volume index	0,17	53,13	28,13	36,00	150,00
Particle size distribution	0,33	64,48	14,48	30,00	437,50
Osmotic pressure	0,25	47,23	9,73	20,00	312,50
<b>Biological tests</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
Helminths	8,00	340,40	40,40	8,00	See note*
ecoli + tcoli	5,17	115,86	38,36	20,00	400,00
HPC	5,17	119,86	42,36	20,00	0,00
<b>Other</b>	<b>Total Duration (hr)</b>	<b>Total cost recovery (R / test)</b>	<b>Discounted cost (R/test)</b>	<b>Max Capacity (tests per day)</b>	<b>Training costs (R/procedure)</b>
MPAES(Salts)	1,50	147,54	83,79	18,00	737,50
MPAES(Metals)	1,50	256,64	192,89	18,00	737,50
Sample Prepration	3,75	41,29	15,04	30,00	
CNS Analyser	0,42	62,78	61,11	90,00	

**\*Helminth training: Training in testing for helminths takes 2 weeks (10 working days). During this time, 20 samples will be analysed. Total training costs for this period are R 24 800.**

<b>Other costs</b>	<b>Unit cost</b>	<b>Notes</b>
Pit emptying	R 2 000/pit	Arranged with sub-contractor as required
Ethics application fee	R 3 600 /application	For international projects
Sampling travel	R 5/km	Travel to area for sampling
Sampling consumables	Varies	Cost of replacing items in sampling box as needed
Workshop travel	R 5/km	Travel to source materials and visit sites
Workshop consumables	Varies	Building materials / consumables for equipment modifications/construction
Overheads		17,5% of total budget