

ENVIRONMENTAL AUDIT REPORT

for



Year: 2021-22



Shri Ramswaroop Memorial College of Engineering and Management

ISO 9001-2008 Certified AICTE approved
Affiliated with Dr A. P. J. Abdul Kalam Technical
University, Lucknow
Tiwari Ganj, Faizabad Road, Lucknow (UP) - 227 105

Prepared by :

ecoMen

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EXECUTIVE SUMMARY

The rapid environmental degradation at local, regional and global level is leading us to global “Environmental poverty”. Stabilization of human population, adoption of environmentally sound and sustainable technologies, reforestation and ecological restoration are crucial elements in creating an equitable and sustainable future for all humans in harmony with nature and natural resources.

Thus, academic leaders must initiate and support mobilization of internal and external resources and knowledge so that their institutions respond to environmental challenges. As an Institution of learning and research, Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM) is deeply concerned and unconditionally believes that there is an urgent need to address these fundamental problems and reverse the trends of environment degradation.

We deeply subscribe to the fact that humans should be stewards of Mother Nature and that we all have a profound responsibility to protect the earth’s resources in perpetuity. Being a premier institution of learning, SRMCEM is aware of its responsibilities towards environmental issues and therefore has resolved to play a major role in the education, research, policy formation and information exchange necessary for a sustained environmental campaign.

This report is based on the approaches and interventions done on part of the College to address the environmental concerns of the SRMCEM campus. The current environmental audit represents the first stage of efforts to build environmental sustainability on the campus.

The audit was conducted by a team of Ecomen with support from various stakeholders of SRMCEM. The audit team interacted with Prof (Dr) Bhavesh Kumar Chauhan, Group Director Shri Ramswaroop Memorial College of Engineering and Management on a number of occasions and his inputs were very important to understand the policies of the Institute related to environment. It is indeed the reflection of SRMCEM endeavor to exercise leadership in promoting sustainability and an institutional obligation to instill among all students and each of us, and those in the broader community a sense of environmental stewardship.

This commitment of SRMCEM has led to actions whose reflection is visible remarkably on ground. This environmental audit conducted is not only significant for the institution, but also for the other institutions to emulate and adopt as a model and therefore contribute regionally as well as nationally in this endeavor of sustainable environment for all.

INTRODUCTION

1.1 Introduction To Environmental Audit

Environmental audit or Green audit is a general term that reflects various kinds of evaluations intended to identify environmental compliance and management system, implementation gaps, along with related corrective actions. It aims to analyze environmental practices within and outside of the concerned sites, which will have an impact on the eco-friendly ambience. Green audit is a useful tool to determine how and where the most energy or water resources are being used and can then considerations be given on how to implement changes and make savings. It can also be used to determine the type and volume of waste, which can be used for a re-cycling project or to improve waste minimization plan. It can create health consciousness and promote environmental awareness, values and ethics. It imparts a better understanding of Green impact on campus to staff and students.

1.2 Need for Environmental Audit

If self-enquiry is a natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is a natural and necessary outgrowth of a quality educational institution. Thus, it is imperative that SRMCEM evaluates its own contributions toward a sustainable future. As environmental sustainability is becoming an increasingly important issue for the nation, the role of higher educational institutions in relation to environmental sustainability is more prevalent.

The rapid urbanization and economic development at local, regional and global level has led to several environmental and ecological crises. On this background, it becomes imperative to adopt the system of the “**Green Campus**” for the Institutes which will lead to sustainable development and at the same time reduces a sizable amount of atmospheric carbon dioxide from the environment.

The National Assessment and Accreditation Council, New Delhi (NAAC) has made it mandatory that all Higher Educational Institutions should submit an annual Green Audit Report. Moreover, it is part of Corporate Social Responsibility of the Higher Educational Institutions to ensure that they contribute towards the reduction of global warming through Carbon Footprint reduction measures.

1.3 Objectives of Environmental Audit

Concern about environmental degradation and realization of values of

environment are logical consequences of scholarly research, teaching and learning process. In its pursuit for improving environmental quality and to maintain a pristine environment for the future generations of students, SRMCEM has made an inquiry on environmental quality of the campus with the following objectives to achieve:

- i. Establishing a base line of existing environmental conditions with focus on natural and physical environment;
- ii. Understanding the current practices of sustainability with regard to the use of water and energy, generation of wastes, purchase of goods, transportation, etc;
- iii. Awareness generation among students concerning real issues of environment and its sustainability
- iv. Promotion of environmental awareness through participatory auditing process and
- v. To create a report that document baseline data of good practices and provide strategies and action plans towards improving environmental quality for future.

1.4 About the College

Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM) is an ISO 9001:2008 certified, AICTE approved, and Dr. APJ Abdul Kalam Technical University, Lucknow affiliated institution. Set in placid surroundings on the Lucknow-Faizabad Highway, the group of institution offers the best in Engineering and Management education. Vision of SRMCEM is to achieve international standards in value based professional education for the benefit of society and the nation. And mission are to dedicate teaching, learning, and collaborating in pursuit of frontier technologies with a spirit of innovation and excellence; to foster human values and ethos, compassion for ecosystem and obligation towards society and the nation; and to provide an environment conducive to continuous learning, and all-round development of college fraternity.



Accordingly, SRMCEM offers graduate in Civil Engineering, Computer Science & Engineering, Information Technology, Electrical Engineering, Electrical & Electronics Engineering, Mechanical Engineering, Electronics and Communication Engineering and post graduate programmes in Engineering, Computer Application and Management.

The SRMCEM campus is located at Lucknow, a large city in northern India, is the capital of the state of Uttar Pradesh, 19 km from Charbagh Railway Station. Regular bus service and shared taxis are frequently available for to & fro movement from the SRMCEM campus. The region in which the SRMCEM campus is located has rich geographic, climatic and cultural diversity. The climate is mild, and generally warm and temperate. The average annual temperature in Lucknow is 25.1°C. Precipitation here is about 999 mm per year. Precipitation is the lowest in November, with an average of 2 mm. Most precipitation falls in July, with an average of 310 mm. At an average temperature of 32.8°C, May is the hottest month of the year. In January, the average temperature is 14.9°C. It is the lowest average temperature of the whole year. The month with the highest relative humidity is August. The teaching programmes designed by Dr. APJ Abdul Kalam Technical University are inter active, flexible and hands on; directed towards helping learners to gain the ability to confidence and effectively answer real life challenges.

Based on AICTE Environment Policy 2020, Universal Human Values has been introduced in the SRMCEM in the curriculum of all the courses. One of the modules of Universal Human Values includes Harmony with Nature, which is about environmental

conservation and sustainable development. It creates an awareness in all the students about ecological sustainability and their roles towards the same. For students of the Civil Engineering Department, a separate subject for Environmental Engineering is already provided.

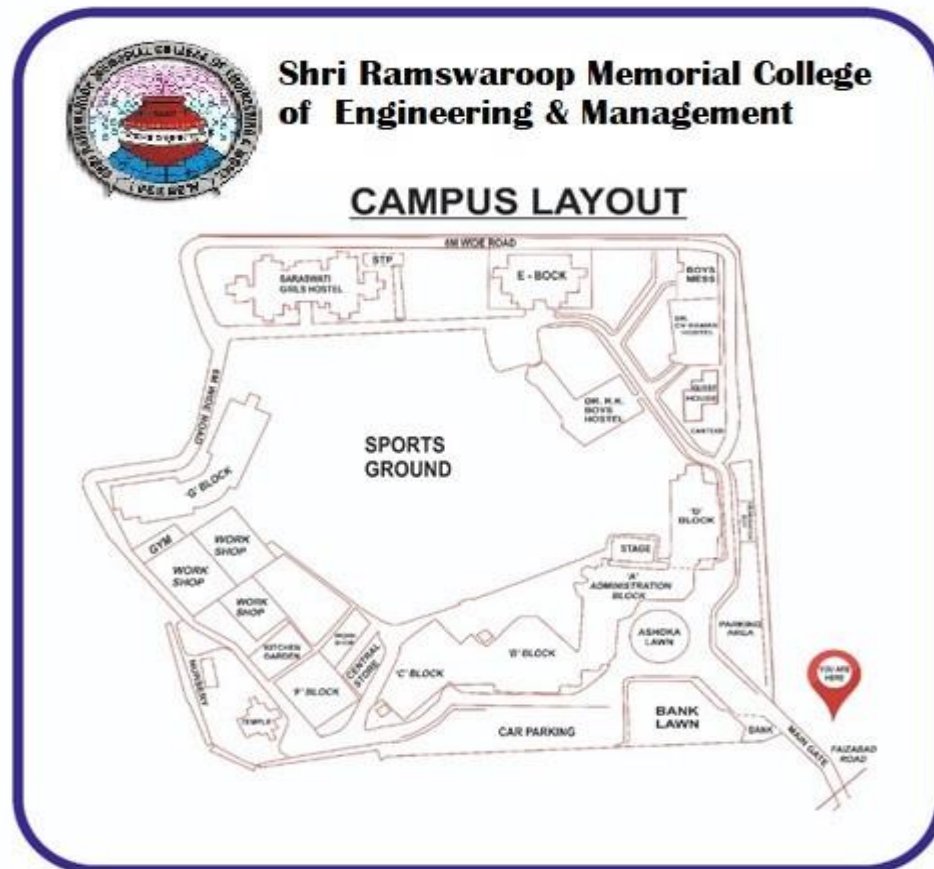


Fig 1. Layout map of SRMCEM



Fig 2. Google map of SRMCEM

Shri Ramswaroop Memorial College of Engineering and Management (SRMCEM) are offering Graduate and Post Graduate facilities to about 4000 nos. of students including post-graduate students in various Discipline. A total of 170 full time teaching faculty, 300 nos. of staff are effectively working for the smooth functioning of the SRMCEM, Lucknow. Around 250 students are under PG and balance are UG students. SRMCEM has outsourced the house keeping to the third party with a team of about 50 persons.

College also offers accommodation to about 624 students. A total of 03 Hostels have been built to accommodate the students, among which 2 are meant for boys namely RK Boys Hostel & CV Raman Boys Hostel and 01 for girls namely Saraswati Girls Hostel with following intake capacity.

Table1.Total in take capacity of the hostels

Name of the Hostel	Total Number of Rooms	Total In take Capacity
RK Boys Hostel	158	178
CV Raman Boys Hostel	116	146
Saraswati Girls Hostel	150	300
Total	424	624

METHODOLOGY

This compilation is based on the Survey by Questionnaire. The survey was done in the whole campus by dividing it into six sections. On the basis of data requirement, set of questionnaires about electricity consumption, water consumption, waste generation, solid waste collection and transport were prepared.

2.1 Survey by questionnaire

Ecomen Team has evolved a questionnaire for survey. The survey was conducted in the SRMCEM Campus. The different questionnaire formats were restructured with different combinations and modifications. The final sets of questionnaires were prepared based on solid waste, energy, fuel, water, hazardous wastes and e-wastes. The framed questionnaires were distributed among students and staff of the college to fetch the information pertaining to the Environmental audit.

The questionnaires contained the general information of the concerned section, including name of the section, total number of students and employees, number of buildings along with the area under build up. The maintaining of records for handling of solid and hazardous wastes holds much importance in green audit. It is quite possible that the loss of water and energy resources can occur due to improper maintenances and therefore their assessment holds importance as far as green audit is concerned.

2.2 Data evaluation

The information gathered during the surveys was compiled for the further analysis. It consists of the audit protocol, documentation supplied by the College administration, the auditor's own recordings, results of the sampling and monitoring photographs, records, plans, maps, audit findings and reviewing documentation against standards, policies and action plans and gathering support to the answers of the questions.

2.3 Analysis and reporting

The completed questionnaires were tabulated as per their modules. This tabulated data was used for further analysis. Average and percentage values were determined to avoid complications. The data regarding plantation was assessed by physical visit, counting of plants etc. Built up map, data on energy, water and solid waste generation was made by the Engineering Department.

SRMCEM on regular interval organized Plantation programs which have healthy participation of students along with the management. Recently SRMCEM organized Van Mahotsava in their campus.



Photographs of Van Mahaostva

DATA ANALYSIS

3.1 Land use

SRMCEM is using land for diverse purposes so that facilities are provided to all concerned for the smooth functioning and working. The Campus covers an area of approximately 51,274 m². After digital image processing of the area, the information about the area occupied by the various land uses from the map is gathered. The data is reflected in Table 3.

Table 2. Area under various land uses in the SRMCEM Campus

Land use	Area(m²)
Built up	15598
Green Spaces	28543
Parks	
Playground	
Road	7133
Vehicle Parking Spaces	
Water Tank	
Other	
Total	51,274

3.2 Energy Audit

Energy audit is the key to systematic approach for decision making in the sphere of energy management. It attempts to balance the total energy inputs with its use and serves to identify all the energy streams in a facility. It quantifies the energy usage according to its discrete functions. The energy is utilized in the Campus for lighting, space heating and cooling, running of laboratory instruments, appliances, water heating, groundwater pumping, cooking and transportation.

The data regarding the energy consumption in the SRMCEM is as following:

Table 3.Total energy consumption of the SRMCEM College

S. No.	Energy Sources		Consumption(annual)
1	Electricity	Madhyanchal Vidyut Vitaran Nigam Ltd. Lucknow (MVVNL)	1834.4 KW
		Solar	56 KW
2	Fuel	LPG	480 cylinders
3	Fuel Oil	Petrol	9600 litres
		Diesel	36000litres

The data in Table 4 indicated that the SRMCEM utilizes renewable as well as non-renewable energy sources to meet its energy needs.

Table 4. Monetary resources spend annually in the year 2020-21 on energy requirement

S. No.	Energy sources	Monetary Value(annual) INR
1	Electricity	99.6 L
2	Fuel oil	36 L
3	LPG*	0.48 L
Total expenditures on energy consumption		136.08 lacs

* Calculations are made on basis on number of LPG cylinders utilized by Hostels wings of SRMCEM.

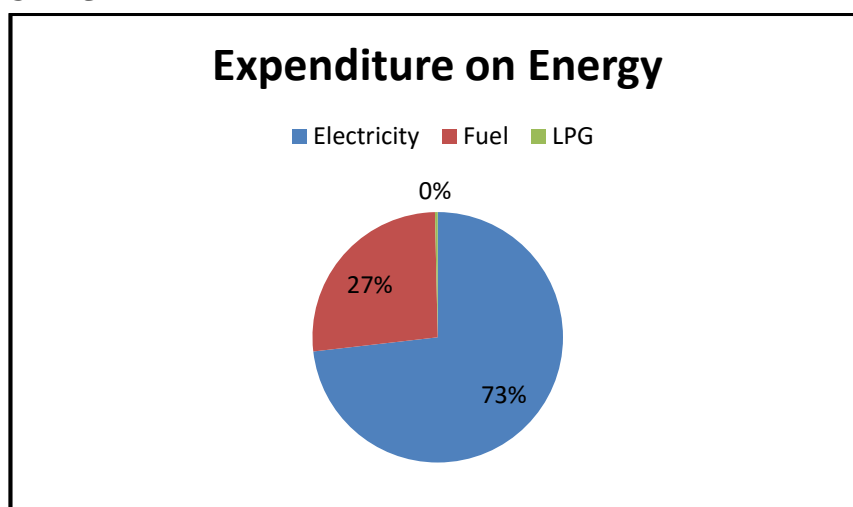


Figure-3 Percentage wise expenditure on energy consumption in terms of monetary values of SRMCEM

Solar Energy:

Most of the energy requirement of the College is met by electricity supplied by the State Government. Some amount of energy requirement is met out of the power generated by the Solar Power Plant commissioned in the Campus.



Plate 1. Provision of Solar Power at SRMCEM Campus

A 56 KW Grid connected Solar Power Plant in the SRMCEM Campus is capable of generating an average of 900 units of electricity a year and it serves as a model for using non-conventional energy sources for future. In addition to the solar power and State electricity, two diesel generators of capacity 600 kVA and 250 kVA with acoustic enclosure are also installed as backup in case of power cuts.



Plate 2. Transformer installed near DG control room



Plate 3. Installed Diesel Generators

Transportation:

Transportation is an important part of any institution relying on the energy consumption. SRMCEM provides transport facility to both students and staff. So Far College owns 17 Operational vehicles of different capabilities which are being used for pick and drop services to distant areas and other purposes. College staff members use personal vehicles and their approximate number goes to 75. Students use college transport services [08 buses], indicating lesser carbon foot print of the student community.



Plate 4: Buses Used for Transportation

3.3 Water Audit

Water audit is conducted to determine water supplied in the distribution system as well as water lost and/or used within a distribution system. It aims to establish the water consumption pattern in individual sections, so as to realize the consumption levels with respect to exploring various pollution prevention and waste water minimization opportunities. Water audit also helps to establish the existing water distribution system as well as waste water collection and recycling, if any. The water is supplied in the SRMCEM campus by water tank. The storage capacity of water in the College is shown in Table 6.

Table 5. Total water storage capacity in the Campus

S. No.	Storage Resources	Number	Storage Capacity (in liters)
1	Water Tanks	27	85000
Total Storage Capacity			85000

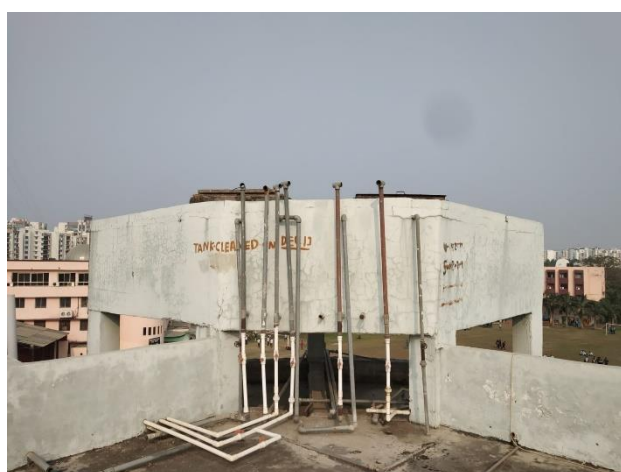


Plate 5. Water tanks in the Campus

The study observed that, tube well and Municipal supply are major sources of water supply in college and hostels. Water is used for drinking purpose, toilets and gardening. The wastewater from the RO water purifier is used for gardening purpose. During the survey, no significant loss of water was observed, neither by any leakages, nor by over flow of water from overhead tanks.

The total water consumption in the Campus is 223.5 KLD. The per capita utilization of the water is 135 Litres per day. The utilizations of such a huge resource of water

include usage for drinking, cleaning, laboratory use garden use, etc.

Table 6. Water Consumption break-up

Particular	Quantity (KLD)
Domestic Use (Drinking, cooking, bathing etc in hostels and Campus)	205
Gardening	15
Laboratory use	2.5
Sweeping /cleaning	1.0
Total	223.5



Plate 6. STP (Sewage Treatment Plant) at SRMCEM Campus

Sewage treatment is a type of wastewater treatment that aims to remove contaminants from sewage to produce an effluent, which is suitable for discharge to the surrounding environment or an intended reuse application, thereby preventing water pollution from raw sewage discharges.

The campus is installed with a 250 KLD capacity of STP, which meet the need for landscape irrigation of the campus. A part of treated water is used in the flushing purposes as well. STP inlet and outlet samples were collected during environmental monitoring and the samples are analyzed for physic-chemical parameters. The results found in the permissible range and enclosed as **Annexure**.



Plate 7. Rain Water Harvesting at SRMCEM Campus

Rainwater harvesting (RWH) is the collection and storage of rain, rather than allowing it to run off. Rainwater is collected from a roof-like surface and redirected to a tank, cistern, deep pit (well, shaft, or borehole), aquifer, or a reservoir with percolation, so that it seeps down and restores the ground water.

Moreover, Construction of four no. of drains has led to collection the runoff and thus conserving the rainwater as well.

3.4 Solid Waste Audit

The solid waste management is in order with the installation of dustbins and their daily cleaning. The SRMCEM has its own collection facility that collects the solid wastes daily from Hostels and Departments. This helps in maintaining the cleanliness by providing an efficient, safe and regulated management of solid wastes in the Campus.

However, no segregation of the waste at source takes place during collection. The solid waste generated in the campus is segregated into bio-degradable and non-bio-degradable lots. While bio-degradable is composted in-house and utilized for horticulture needs, the non-bio-degradable is disposed-off through garbage disposal system of Nagar Nigam, Lucknow. Studies were carried to assess the composition of the waste generated in the campus. The data showed that the total generation of solid waste in the Campus is 988 kg/day. Out of which biodegradable is 445 kg/day while then non-biodegradable is 543 kg/day. It is noteworthy that SRMCEM has adopted an environmentally sound practice of converting biodegradable waste into compost which is a useful resource. The compost produced is used in the nurseries and the gardens within the Campus.

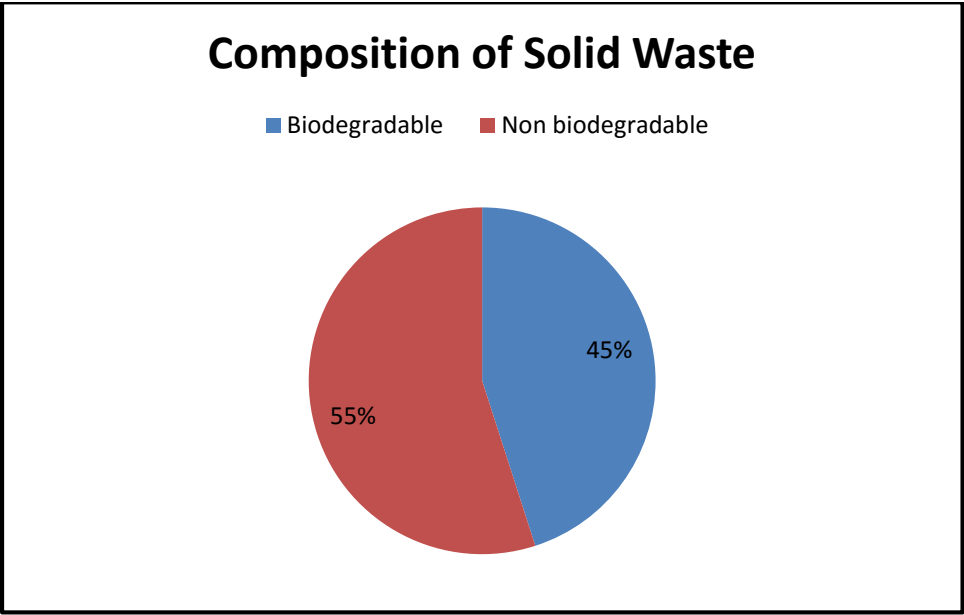


Fig-4 Percentage composition of generated waste in SRMCEM





Plate 8. Waste Management and Waste collection at SRMCEM Campus



Plate 9. Composting at SRMCEM Campus

The study showed that biodegradable waste constitutes significant component of solid waste in the Campus. The non-biodegradable component of solid waste is recyclable. Among there cyclable materials, paper constitutes the maximums share followed by glass, cardboard and plastics.

3.5 Plantation audit

The SRMCEM maintains many small gardens. Due to extensive plantation drives the campus is turned in to a lush green spot with fair magnitude of biodiversity. Around 250 nos. of plants are planted in the SRMCEM campus have assumed a full canopy now and have attracted a lot of faunal diversity including birds, reptiles and small mammals. More than 50% area of the campus is green having different species including pines, broad leaved trees, shrubs, and perennial herbs.



Plate 10. Green Spaces and Parks in SRMCEM

3.6 Safe Campus

The college campus has equally focused over the prevention from disaster and safety measures. The college campus has put Fire hydrant at different places.



Plate 11. Fire Hydrant in SRMCEM

The college campus has established a nursery, garden and park with its own financial support. The topography and altitudinal gradient is of approximately 123 meters (404 ft) above sea level of the SRMCEM campus helps it support diverse vegetation of the tropical and temperate types. The college campus is the conservatory of more than 25 species of trees belonging to Mango, Lychee, Lemon, Jackfruit, Guava, Blackberry, Peach Tree, Ziziphus, Stone Apple, Indian gooseberry, Monkey fruit, Palm Tree, Noseberry, Star fruit, Pomegranate, Banana, Black Currant, Pomelo, Pear, Papaya, Amberet care grown in the campus. However, Herbs and Shrubs a real so grown in the Garden of the Campus.



Plate 12. Nursery at SRMCEM

Table 7. Number of different plant of different types of vegetation

S. No.	Name of Plant	Total No.	Locations of Tree
1	Mango	62	Back lawn, Girls hostel, Car parking etc.
2	Lychee	10	Between Hostels Road side
3	Lemon	17	Canteen & Girl Hostel
4	Jackfruit	26	Between Girl hostel & E Block Road side
5	Guava	36	Hostels, Back Lawn, Chemistry lab
6	Blackberry	22	Girls hostel, Nursery and G Block
7	Peach Tree	6	Canteen
8	Ziziphus	4	Near Temple
S. No.	Name of Plant	Total No.	Locations of Tree
9	Stone Apple	5	Near Temple and G Block
10	Indian gooseberry	20	Near Temple and C Block
11	Monkey fruit, or Monkey jack or Barhal	1	C V Raman Hostel
12	Palm Tree	1	Back Lawn

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13	Noseberry	1	Girls Hostel
14	Star fruit	2	Girls Hostel
15	Pomegranate	4	Girls Hostel
16	Banana	4	Near Temple
17	Black Currant	12	Behind Girls Hostel
18	Pomelo	4	Near Canteen
19	Pear	01	AT the corner of D Block
20	Papaya	10	Kitchen Garden
21	Amber	1	Car Parking
Total		249	



Recommendations

The short term and long- term suggestion to take environment protection to higher levels and it is hoped that this will receive due attention of SRMCEM authorities and also all stake-holders of the College.

1. Environmental auditing may be conducted by the SRMCEM every year to maintain status updates.
2. Quarterly Environmental monitoring/analysis for ambient air, DG sets, drinking water STP outlet water, noise etc may be conducted by the SRMCEM to check environmental conditions within campus.
3. Specific waste management plans should be adopted to manage solid waste in the campus, with the assistance of State Swachhta Mission. Use of plastic carry bags, thermocol cups, plates and flex boards should be banned inside the Campus.
4. Propose a system for collection and disposal of waste sorted out as organic and others on a daily basis, managed by the campus administration. For managing organic wastes, biogas plants may be commissioned at the hostels and canteens. There should be a system for the management of e-waste and hazardous wastes.
5. The public lights within the campus may be run with solar panels and the replacement of existing lights should be done with LED lamps.
6. Frame a holistic campus development plan to foresee the future developmental needs in tune with green charter adopted by the SRMCEM.
7. Green habitat concept should be adopted for all the building construction activities of the Campus in future, which may help a long way in reducing energy usage, increasing aesthetic appeal of the buildings and class rooms, besides reducing carbon foot print. Further, more green spaces should be established all around the campus around larger trees and shades for the benefit of the students.
8. To encourage the students one credit may be given to students' participating in environmental conservation/awareness activities.



Plate 13. Glimpses of Green at SRMCEM Campus

Environment Monitoring Reports

Reports	Parameters	Locations
Ambient Air Quality	PM _{2.5} , PM ₁₀ , SO ₂ and NO _x	Beside DG Set Control Room, Beside STP Plant, Near Gate of Girls Hostel and At Podium of College Ground
Ambient noise Level Monitoring	As per CPCB	Main Gate College Ground Beside DG Set Control Room, Beside STP Plant, Near Gate of Girls Hostel and At Podium of College Ground
Flue gas Emission	PM, SO ₂ , NO _x and CO	DG Set Area (600 kVA and 250 kVA)
Illumination	As per CPCB	Class Room -1, Class Room-2
Drinking Water	ISO 10500:2012	Near DG Room
Waste Water Report	pH, TSS, TDS, BOD, COD, O & G	STP Plant
Soil Analysis	As per CPCB	Park, beside Admin office & Bio compost Area

All the reports are enclosed as Annexures

ECOMEN LABORATORIES PVT. LTD.

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LABORATORIES PVT LTD.**An approved Laboratory from Ministry of Environment, Forest and Climate Change, Govt. of India, New Delhi****Annexure**

FORMAT NO. ECO/QS/FORMAT/10

TEST REPORT NO: ECO LAB/AAQ/821/01/22

TEST REPORT ISSUE DATE: 21.01.2022

TEST REPORT OF AMBIENT AIR

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Date of Sampling : January 14th, 2022
Sample Collected By : Mr. Aman Dixit & Mr. Arvind Singh
Sampling Method : IS: 5182
Instrument Used : Respirable Dust Sampler &
Fine Dust Sampler

Sl. No.	Tests Conducted	Method	Locations				NAAQ Standards as per CPCB, New Delhi, Nov. 18 th , 2009
			2887	2888	2889	2890	
1.	PM _{2.5} (µg/m ³)	IS:5182(Part-24)	46.3	38.8	32.5	41.5	60
2.	PM ₁₀ (µg/m ³)	IS:5182 (Part-23)	64.5	57.5	61.3	59.7	100
3.	SO ₂ (µg/m ³)	IS:5182 (Part-2)	13.53	11.5	14.5	10.5	80
4.	NO _x (µg/m ³)	IS:5182 (Part-6)	24.5	18.5	22.4	16.8	80

Note:

2887 = Beside DG Set Control Room, 2888 = Beside STP Plant, 2889 = Near Gate of Girls Hostel and 2890 = At Podium of College Ground

Standards

Ambient Air Quality Standard for Residential, Industrial, Rural and Other Area.

Verified By


Technical Manager

Authorized By


Quality Manager

----End of Report----

Ecomen Laboratories Pvt. Ltd.
Second Floor Hall, House No. B-1/8,
Sector-H, Aliganj, Lucknow - 226024

FORMAT NO. ECO/QS/FORMAT/13 TEST REPORT NO: ECO LAB/AN/821/01/22
TEST REPORT ISSUE DATE: 21.01.2022

TEST REPORT OF AMBIENT NOISE LEVEL MONITORING
Noise Pollution (Prevention & Control) Act 2000

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Instrument Used : Noise Meter (Cirrus)
Test Method : IS: 4412, Part-1 & 2, 1991
Sample Collected By : Mr. Aman Dixit & Mr. Arvind Singh
Date of Sampling : January 14th, 2022

Sl. No.	Locations	Day Time		Night Time	
		Time	Leq Value in dB(A)	Time	Leq Value in dB(A)
1.	Main Gate	10.30 A.M.	61.00	10.00 P.M	41.00
2.	College Ground Centre	11.00 A.M.	50.00	10.30 P.M	38.00
3.	Near DG Set Control Room	11.30 A.M.	63.00	11.00 P.M	43.00
4.	Near STP Plant	12:00 P.M.	58.30	11.30 P.M	44.00
5.	Near Gate of Girls & Hostel	12:30 P.M.	51.20	12.00 A.M	35.00
6.	At Podium in College Ground	01:00 P.M.	48.30	12.30 A.M	36.00

Noise (Ambient Standard)

Area Code	Category of area	Limit in dB (A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Silence Zone	50	40

Note:

1. Day time is reckoned in between 6:00 AM and 10:00 PM.
2. Night time is reckoned in between 10:00 PM and 6:00 AM
3. Silence zone is defined as area up to 100m around such premises as hospitals, educational institutions & courts. The silence zones are to be declared by a competent authority.
4. Mixed categories of areas should be declared as one of the four above-mentioned categories by the competent authority and the corresponding standard shall apply.

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FORMAT NO. ECO/QS/FORMAT/12

TEST REPORT NO: ECO LAB/Stack/821/01/22

TEST REPORT ISSUE DATE: 21.01.2022

TEST REPORT OF FLUE GAS EMISSIONS

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Sampling Method : IS: 11255
Instrument Used : Stack Monitoring Kit
Sample Collected By : Mr. Aman Dixit & Mr. Arvind Singh
Date of Monitoring : 14.01.2022
Source of Emission : Exhaust Emission
Sample ID Code : (Eco/AS/3081)

Details of Stack

Material of Construction : M.S.
*Stack Attached to : DG Set
*Capacity : 609 KVA
* Stack Height from Ground Level (m) : 12.0
Stack Top : Circular
Inside Diameter of Stack (m) : 0.30
(at sampling point)
Cross Sectional Area of Duct/Stack (m²) : 0.70
Ambient Air (°C) : 20.0
Flue Gas Temperature (°C) : 128.0
Exit Velocity of Gas (m/sec.) : 6.65
Flow Rate (Nm³/ sec.) : 3.37
*Type of Fuel : HSD
*Quantity of Fuel Consumption (lit/hr) : 85.0

Sl. No.	Tests Conducted	Method	<u>Pollutant Concentration in</u> <u>gm/Kw-hr</u>	Standards as per CPCB <u>gm/Kw-hr</u>
1.	Particulate Matter (PM)	IS:11255 (Part-1)	0.074	0.2
2.	Sulphur Dioxide (SO ₂)	IS:11255 (Part-2)	0.038	-
3.	Oxides Nitrogen (NO _x)	IS:11255 (Part-7)	0.12	4.0
4.	Carbon Monoxide (CO)	IS:13270	1.12	3.5

Note: *Provided By Party.

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FORMAT NO. ECO/QS/FORMAT/12

TEST REPORT NO: ECO LAB/Stack/821/01/22

TEST REPORT ISSUE DATE: 21.01.2022

TEST REPORT OF FLUE GAS EMISSIONS

Name of the Customer : Shri Ramswaroop College of Engineering and Management
 Address of the Customer : Tiwariganj, Faizabad Road,
 Distt. Lucknow (U.P.) - 226028
 Sampling Method : IS: 11255
 Instrument Used : Stack Monitoring Kit
 Sample Collected By : Mr. Aman Dixit & Mr. Arvind Singh
 Date of Monitoring : 14.01.2022
 Source of Emission : Exhaust Emission
 Sample ID Code : (Eco/AS/3080)

Details of Stack

Material of Construction : M.S.
 *Stack Attached to : DG Set
 *Capacity : 250 KVA
 *Stack Height from Ground Level (m) : 12.0
 Stack Top : Circular
 Inside Diameter of Stack (m) : 0.30
 (at sampling point)
 Cross Sectional Area of Duct/Stack (m²) : 0.70
 Ambient Air (°C) : 19.5
 Flue Gas Temperature (°C) : 102.0
 Exit Velocity of Gas (m/sec.) : 4.24
 Flow Rate (Nm³/ sec.) : 0.54
 *Type of Fuel : HSD
 *Quantity of Fuel Consumption (lit/hr) : 30.0

Sl. No.	Tests Conducted	Method	Pollutant Concentration in gm/Kw-Hr	Standards as per CPCB gm/Kw-Hr
1.	Particulate Matter (PM)	IS:11255 (Part-1)	0.055	0.2
2.	Sulphur Dioxide (SO ₂)	IS:11255 (Part-2)	0.042	-
3.	Nitrogen Dioxide (NO ₂)	IS:11255 (Part-7)	1.08	4.0
5.	Carbon Monoxide (CO)	IS:13270	1.14	3.5

Note: *Provided By Party.

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FORMAT NO. ECO/QS/FORMAT/10 TEST REPORT NO: ECO LAB/Illumination/821/01/2
TEST REPORT ISSUE DATE: 21.01.2022

TEST REPORT OF ILLUMINATION*

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Date of Sampling : January 14th, 2022
Sample Collected By : Mr. Aman Dixit & Mr. Arvind Singh
Instrument Used : Lux Meter TancoModor,
Model No.-HTC LX-101

Sl. No.	Locations	Illumination (Lux)	Limit as Per IS 3646
1	Class Room -1	475	500
2	Class Room -2	468	500
3	Reception	476	500
4	DG Room	220	200
5	Main Gate	265	250

*The results is related only to tested item.

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FORMAT NO. ECO/QS/FORMAT/09

TEST REPORT NO: ECO LAB/DW/1534/01/22

TEST REPORT ISSUE DATE: 22.01.2022

TEST REPORT OF DRINKING WATER*

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road, Distt. Lucknow (U.P) - 226028
Sampling Method : APHA (IS 3025)
Sample Collected by : Mr. Arvind Singh
Date of Sampling : 14.01.2022
Date of Receiving : 15.01.2022
Date of Analysis : 15.01.2022 to 22.01.2022
Source of Sample : Tap Water Near DG Room
Sample ID Code : ELW-15339

Sl. No.	TESTS	PROTOCOL	RESULT	Detection Range	INDIAN STANDARDS as per IS 10500:2012(Reaff:2018)	
					Desirable	Permissible
1.	Colour (Hazen unit)	APHA, 23 rd Ed. 2017, 2120 B	<5.0	5-100	5.00	15.0
2.	Odour	APHA, 23 rd Ed. 2017, 2150 B	Agreeable	Qualitative	Agreeable	Agreeable
3.	Taste	APHA, 23 rd Ed. 2017, A+B	Agreeable	Qualitative	Agreeable	Agreeable
4.	Turbidity as (NTU)	APHA, 23 rd Ed. 2017, 2130-A+B	1.02	1 - 100	1.0	5.0
5.	pH	APHA, 23 rd Ed. 2017, 4500H ⁺ A+B	7.63	2.0 -12	6.5-8.5	No Relax.
6.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540-C	198.0	5 - 5000	500	2000
7.	Alkalinity as CaCO ₃ (mg/l)	APHA, 23 rd Ed. 2017, 2320 A+B	72.0	5-1500	200	600
8.	Total Hardness as CaCO ₃ (mg/l)	APHA, 23 rd Ed. 2017, 2340 A+C	88.0	5-1500	200.0	600.0
9.	Calcium as Ca (mg/l)	APHA, 23 rd Ed. 2017, 3500 Ca A+B	16.0	5 - 1000	75.0	200.0
10.	Magnesium as Mg (mg/l)	APHA, 23 rd Ed. 2017, 3500 Mg A+B	11.66	5-1000	30.0	100.0
11.	Copper as Cu (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.05-5	0.05	1.5
12.	Iron as Fe (mg/l)	APHA, 23 rd Ed. 2017, 3500 Fe B	0.09	0.02-50	0.3	No Relax.
13.	Manganese as Mn (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.1-5	0.10	0.30
14.	Chloride as Cl (mg/l)	APHA, 23 rd Ed. 2017, 4500 Cl A+B	12.0	5-1000	250.0	1000.0
15.	Sulfate as SO ₄ (mg/l)	APHA, 23 rd Ed. 2017, 4500-SO ₄ ²⁻ E	15.1	1.0 -250	200.0	400.0
16.	Nitrate Nitrogen as NO ₃ (mg/l)	APHA, 23 rd Ed. 2017, 4500-NO ₃ B	5.02	5.0 - 100	45.0	No Relax.
17.	Fluorides as F (mg/l)	APHA, 23 rd Ed. 2017, 4500-C	0.21	0.05-10	1.0	1.5
18.	Phenolic Compounds as C ₆ H ₅ OH (mg/l)	APHA, 23 rd Ed. 2017, 5530 A+C	BDL	1-10	0.001	0.002
19.	Mercury as Hg (mg/l)	APHA, 23 rd Ed. 2017, 3112 A+B	BDL	0.001-1	0.001	No Relax.
20.	Cadmium as Cd (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.002-2	0.003	No Relax
21.	Arsenic as As (mg/l)	APHA, 23 rd Ed. 2017, 3114 C	BDL	0.01-2	0.01	0.05
22.	Lead as Pb (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	BDL	0.01-2	0.01	No Relax.
23.	Zinc as Zn (mg/l)	APHA, 23 rd Ed. 2017, 3111 A+B	0.12	0.02-50	5.0	15
24.	Anionic Detergents (As MBAS)(mg/l) max	APHA, 23 rd Ed. 2017, 5540 A+C	BDL	0.01-5	0.2	1.0
25.	Chromium (Hexavalent) (mg/l)	APHA, 23 rd Ed. 2017, 3111A+B	BDL	0.05-20	0.05	No Relax.
26.	Mineral Oil 6 (mg/l)	IS 3025 (Part 39) Class -6	BDL	0.01-10	0.5	No Relax.
27.	Free Residual Chlorine (mg/l)	APHA, 23 rd Ed. 2017, 4500-Cl B	BDL	0.5-10	0.20	1.0
28.	Boron as B (mg/l)	APHA, 23 rd Ed. 2017, 4500 B A+C	BDL	0.2 - 10	0.5	1.0
29.	Total coliform (MPN/100 ml)	APHA, 23 rd Ed. 2017, 9221 B+C	Absent	1.8	Absent	Absent
30.	E.coli (MPN/100 ml)	APHA, 23 rd Ed. 2017, 9221 B+E	Absent	1.8	Absent	Absent

Statement of Conformity: The above tested parameters confirm as per INDIAN STANDARDS as per IS 10500:2012(Reaff:2018) limits for above tested parameters and the results are related to the sample tested.

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Technical Manager

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Quality Manager

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1534/01/22

TEST REPORT ISSUE DATE: 22.01.2022

TEST REPORT OF WASTE WATER*

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Sampling Method : APHA (IS 3025)
Sample Collected by : Mr. Arvind Singh
Date of Sampling : 14.01.2022
Date of Receiving : 15.01.2022
Date of Analysis : 15.01.2022 to 22.01.2022
Source of Sample : STP Inlet
Sample ID Code : ELW-15337

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection
1.	pH	APHA, 23 rd Ed. 2017, (4500 H+B)	6.85	2.0-12.0
2.	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, (2540D)	86.3	5-5000
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, (2540C)	368.0	5-5000
4.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 rd Ed. 2017, (5210 B)	22.0	5-10000
5.	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, (5220 B)	164.0	5-50000
6.	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, (5520 B)	5.1	5-600

Statement of Conformity: The above tested parameters confirm as per G.S.R 422 (E) limits for above tested parameters and the results are related to the sample tested.

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FORMAT NO. ECO/QS/FORMAT/07

TEST REPORT NO: ECO LAB/DW/1534/01/22

TEST REPORT ISSUE DATE: 22.01.2022

TEST REPORT OF WASTE WATER*

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Sampling Method : APHA (IS 3025)
Sample Collected by : Mr. Arvind Singh
Date of Sampling : 14.01.2022
Date of Receiving : 15.01.2022
Date of Analysis : 15.01.2022 to 22.01.2022
Source of Sample : STP Outlet
Sample ID Code : ELW-15338

Sl. No.	TESTS	PROTOCOL	RESULT	Limits of Detection	G.S.R 422(E)
					Desirable
1.	pH	APHA, 23 rd Ed. 2017, 4500H+ A+B	7.78	2.0-12.0	5.5-9.0
2.	Total Suspended Solid as TSS (mg/l)	APHA, 23 rd Ed. 2017, 2540-D	19.5	5-5000	100.0
3.	Total Dissolved Solids as TDS (mg/l)	APHA, 23 rd Ed. 2017, 2540-C	335.0	5-5000	-
4.	Biochemical Oxygen Demand as BOD (mg/l)	APHA, 23 rd Ed. 2017, 5210 A+B	12.0	5-10000	30.0
5.	Chemical Oxygen Demand as COD (mg/l)	APHA, 23 rd Ed. 2017, 5220 A+C	68.0	5-50000	250.0
6.	Oil & Grease as O & G (mg/l)	APHA, 23 rd Ed. 2017, (5520 B)	BDL	5-600	10.0

Statement of Conformity: The above tested parameters confirm as per G.S.R 422 (E) limits for above tested parameters and the results are related to the sample tested.

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E-mail: contactus@ecomen.in, Website: www.ecomen.in, CIN - U74210UP1989PTC010601, GSTIN : 09AAACE6076H1Z1**ecoMen**
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TEST REPORT ISSUE DATE: 22.01.2022**TEST REPORT OF SOIL***

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Sampling Method : IS-2720
Sample Collected by : Mr. Arvind Singh
Date of Sampling : 14.01.2022
Date of Receiving : 15.01.2022
Date of Analysis : 15.01.2022 to 22.01.2022
Source of Sample : Bio compost Area
Sample ID Code : ELS-600

Sl. No.	Parameters	Unit	Results
1.	pH (1:5)	-	8.12
2.	Electrical Conductivity (1:5)	µmhos/cm	138.6
3.	Moisture	(%)	21.6
4.	Organic Matter	(%)	3.22
5.	Organic carbon	(%)	1.2
6.	Available Potassium as K ₂ O	(mg/kg)	63.1
7.	Available Sodium as Na ₂ O	(mg/kg)	36.9
8.	Available Calcium as Ca	(mg/kg)	220.0
9.	Available Magnesium as Mg	(mg/kg)	76.0
10.	Sulphate as SO ₄	(mg/kg)	68.9
11.	Iron as Fe	(mg/kg)	12.3
12.	Sodium absorption ratio as SAR	(%)	0.54
13.	Cation Exchange Capacity	(meq/100g)	14.36

*The result are related only to item tested.

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TEST REPORT ISSUE DATE: 22.01.2022**TEST REPORT OF SOIL***

Name of the Customer : Shri Ramswaroop College of Engineering and Management
Address of the Customer : Tiwariganj, Faizabad Road,
Distt. Lucknow (U.P) - 226028
Sampling Method : IS-2720
Sample Collected by : Mr. Arvind Singh
Date of Sampling : 14.01.2022
Date of Receiving : 15.01.2022
Date of Analysis : 15.01.2022 to 22.01.2022
Source of Sample : Park Beside Admin Office
Sample ID Code : ELS-601

Sl. No.	Parameters	Unit	Results
1.	pH (1:5)	-	7.96
2.	Electrical Conductivity (1:5)	µmhos/cm	105.6
3.	Moisture	(%)	18.2
4.	Organic Matter	(%)	2.63
5.	Organic carbon	(%)	0.96
6.	Available Potassium as K ₂ O	(mg/kg)	54.3
7.	Available Sodium as Na ₂ O	(mg/kg)	28.9
8.	Available Calcium as Ca	(mg/kg)	180.0
9.	Available Magnesium as Mg	(mg/kg)	64.0
10.	Sulphate as SO ₄	(mg/kg)	49.6
11.	Iron as Fe	(mg/kg)	9.62
12.	Sodium absorption ratio as SAR	(%)	0.47
13.	Cation Exchange Capacity	(meq/100g)	17.36

*The result are related only to item tested.

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