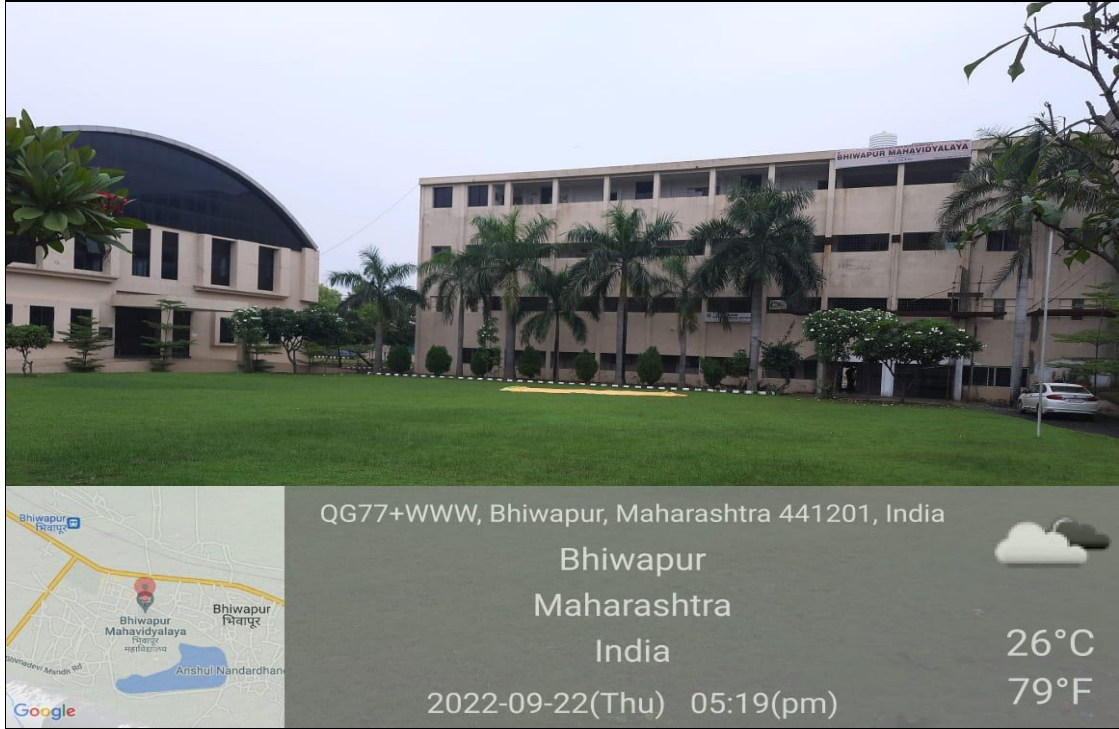




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**ENVIRONMENT AUDIT REPORT
CONSULTATION REPORT**



**Bhiwapur Mahavidyalaya
Bhimadevi Temple Road, Near Telephone Exchange Office,
At Post Taluka: BHIWAPUR
Dist: Nagpur (M.S.) India- 441201**

PREPARED BY

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(2020-21)



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ACKNOWLEDGEMENT

Empirical Exergy Private Limited (EEPL), Indore takes this opportunity to appreciate & thank the management of **Bhiwapur Mahavidyalaya, Bhiwapur Dist. Nagpur, Maharashtra.** for giving us an opportunity to conduct Environment audit for the college.

We are indeed touched by the helpful attitude and co-operation of all faculties and technical staff, who rendered their valuable assistance and co-operation the course of study.

Rajesh Kumar Singadiya

(Director)

M.Tech (Energy Management), PhD (Research Scholar)
Accredited Energy Auditor [AEA-0284]
Certified Energy Auditor [CEA-7271]
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Empanelled Energy Auditor with MPUVN, Bhopal M.P.
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EXECUTIVE SUMMARY

The executive summary of the Environment audit report furnished in this section briefly gives the identified water conservation measures, that can be implemented in a phased manner to water conservation and increase the productivity of the college.

AREAS FOR IMPROVEMENT AND RECOMMENDATION

FRESH WATER MONITORING SYSTEM:

- ✚ Installation of “Cloud based (IoT based) ground water extraction monitoring system” for Borewell to quantify fresh water consumption per day in the College.
- ✚ Install water flow meters (Mechanical or Electronics) in distribution network, like college building, main line and gardening line for quantity per day water consumption and waste water generation in the College campus.

WASTE WATER TREATMENT PLANT

- ✚ Waste water generated from various departments and canteen should be collect in separate waste water collection tank. It should be treated in proposed STP. after that treated water reuse activity like gardening, toilet and wash room etc.

USE EFFICIENT WATER TAPS

- ✚ Water saving taps either reduce water flow or automatically switch off to help save water. So, it is highly recommended to install efficient water taps in university campus to reduce water consumption.

USE EFFICIENT URINAL TAPS.

- ✚ Replacing these inefficient fixtures with water sense labelled flushing urinal can save between 0.5 to 04 litter per flush without sacrificing performance. Installing water saving flushing urinal will not only reduce water use in facilities but also save money on water bills.

INSTALLATION OF WATER OVERFLOW SENSOR IN TANKS.

- ✚ It is observed that water overflow in overhead tanks after filling. So tank, it is recommended installation of water overflow sensor to avoid water overflow.



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**CHAPTER-1
INTRODUCTION**

1.1 About College

Bhiwapur Mahavidyalaya stands as a synonym today for quality education as envisioned by its Founder, Heavenly Bhausaheb Govindrao Mulak in the mufassil area of Bhiwapur tehsil, Nagpur District. As on today, the Institution has blossomed into a full -grown tree catering to professional and conventional schooling to the rural masses.

At a time, when there were no educational institutions in the vicinity, a visionary Late Bahusaheb Govindraoji Mulak pioneered the noble cause of providing edification to the rural folks and under the tutelage of a Charitable Trust named Backward Class Youth Relief Committee in 1974, which initiated a beginning of new epoch in Higher Education in Vidarbha region of Maharashtra State. The stride of the Trust began by establishing Colleges all over with an Engineering College named KDK College of Engineering in 1981. The beacon of light of education dispersed throughout Vidarbha with seventeen institutions imparting learning in almost all the branches of Higher Education.

Bhiwapur Mahavidyalaya is located in Bhiwapur, a rural place with 137 small villages and is very close to the tribal dominated belt of forest area. Located in the serene natural environment with lush green forests and agriculture as the basic occupation, Bhiwapur a small flourishing town is 72 K.M. away from Nagpur. Bhiwapur Mahavidyalaya affiliated to Nagpur University, now Rashtrasant Tukadoji Maharaj Nagpur University was established in 1990 with Arts faculty with the sole objective of imparting education in the field of Higher Studies to enable the rural youth to learn locally and flourish globally despite the tribulations and dearth of abundance.

The journey of elevating the youth continued with the initiation of Commerce Faculty in 2002, B.Sc. in 2012 and B. Voc. in 2019. The stride and vision of the Founder strengthened in its conceptualization with the introduction of Post Graduate courses in Economics, Political Science and Sociology in 2004. Over the years, the noble vision manifested and carved a niche for itself and earned the recognition for the Institution as one of the premier co-educational Institutions in Nagpur region imparting quality education with the strong support of highly competent and skilled teaching and non-teaching staff.



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Keeping up with pace of the dynamic changes in the field of education, the Institution has kept itself abreast with ICT enabled classrooms, independent Departments; E.T.N.L software supported English Language Lab, state-of-the-art Computer Lab, fully automated Central Administrative Office and Central Library with spacious reading room and UGC Network Resource Centre. Today, the Institution is transforming its envisioned objectives into a reality through quality knowledge dissemination.

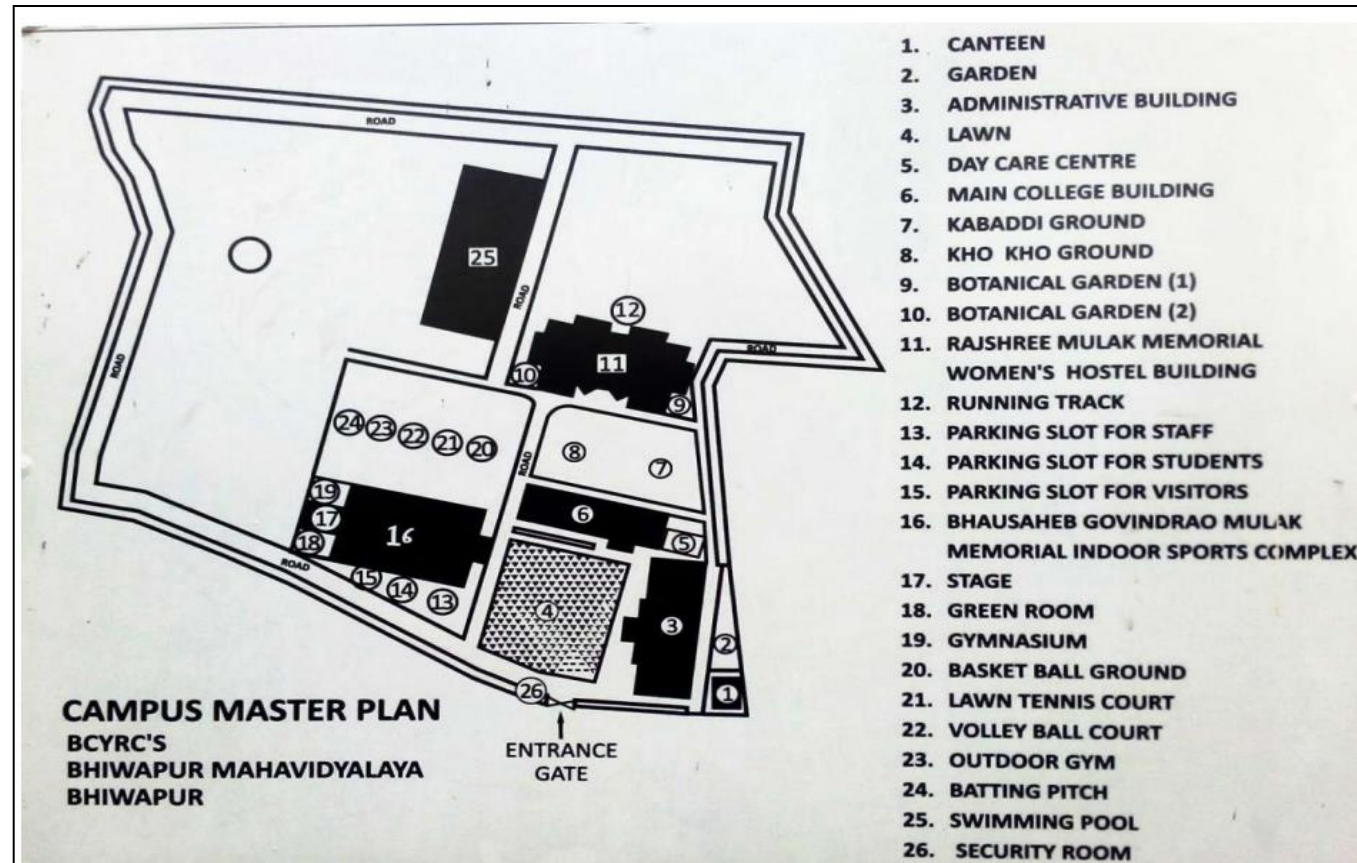
Over the years, the Institution has taken strides to fulfill its vision, mission and quality initiatives. It is proud moment in the history of the Institute to apprise all its stakeholders of the elevation and up gradation of its infrastructural facilities like multi-purpose Auditorium, Conference Hall, Common rooms for girls and boys, canteen, Gymnasium, playgrounds. The Institutions avowals the presence of International Level Swimming Pool and Indoor Stadium to strengthen the learners of the rural areas to compete unabashedly with zest in the world outside Bhiwapur. Gender equity and sensitization are an integral part of the institution's policy of empowering women's education. The Women's Hostel Building enables the girl students to accomplish their dreams of getting quality education. The Institution surpasses in rendering requisite facilities for the students to grow and live a dignified life



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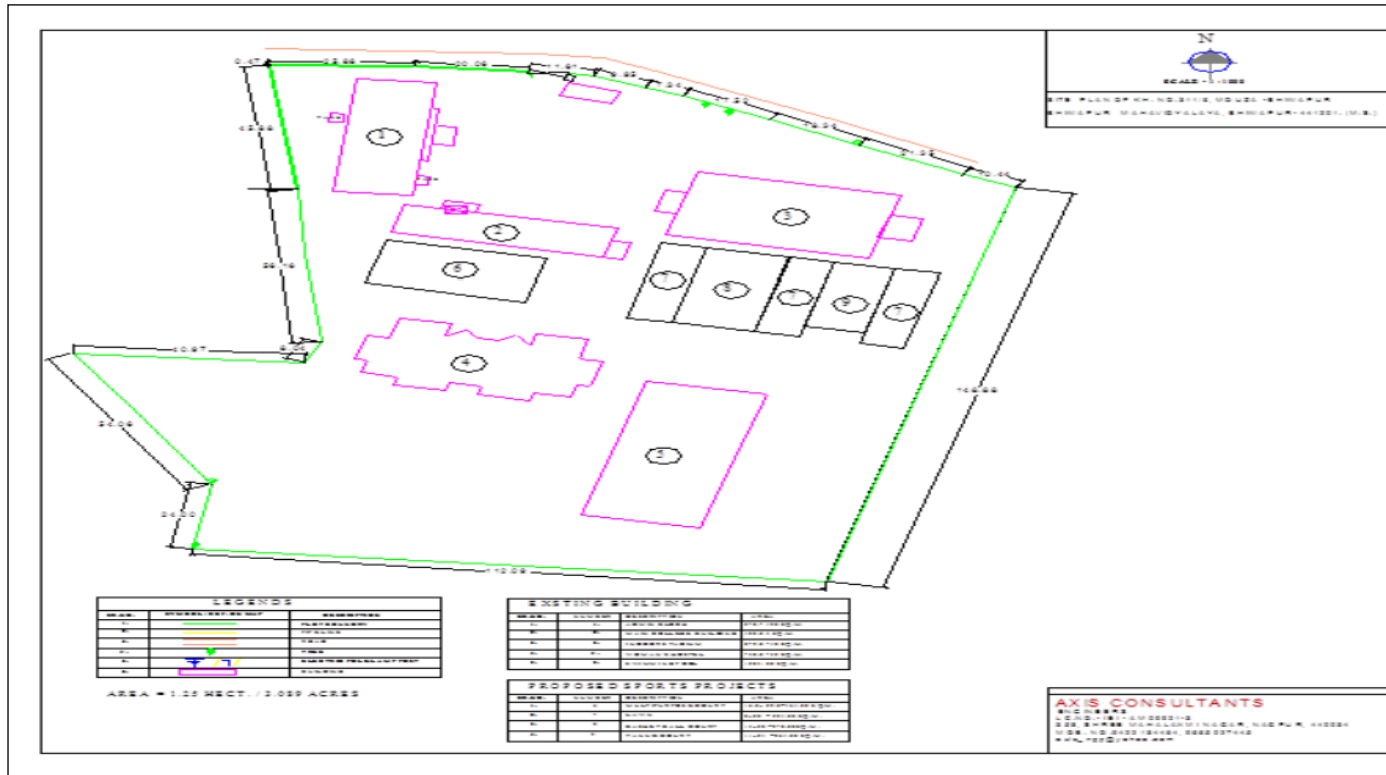


COLLEGE LAYOUT OF VARIOUS FLOORS





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1.2 Environment Monitoring Committee

Backward Class Youth Relief Committee's
BHIWAPUR MAHAVIDYALAYA
Arts, Commerce & Science Faculties (Junior and Senior)
At. Po. Bhiwapur, Distt. Nagpur (MS) -441201
Accredited with Grade B (CGPA-2.54) by NAAC, Bengaluru
Ph. No. 07106-232349 : Fax No. 07106-232064 Web site : www.bgm.ac.in
Email: bmv_bhiwapur@yahoo.com

Dr. Jobi George M.A. (Eng.) M.Phil, Ph.D Principal	Smt. Sumanmala B. Mulak President B.C.Y.R.C. B.M.C.T. Khamla, Nagpur	Shri. Rajendra Mulak M.Com. L.L.B. Ex. Minister of State Finance & Planning, Water Resources, Excise, Energy & Parliamentary Affairs (M.S.) Secretary B.C.Y.R.C., B.M.C.T. Khamla, Nagpur
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Ref. No./B.M.V/2021-22/EWGFA C/6649 Date 22/11/2021

ENERGY, WATER, GREEN AND ENVIRONMENT AUDIT COMMITTEE

Energy, Water, Green and Environment audit committee will consist of following members.

Sr. No.	Name of the Member	Designation	Department
01	Dr. Jobi George	Principal	Chairman
02	Dr. Mangesh V. Kadu	IQAC Co-ordinator	Political Science
03	Dr. Motiraj R. Chavhan	Asst. Professor	History
04	Shri. Somehwar Wasekar	Asst. Professor	English
05	Shri. Sagar M. Yadav	Jr. Lecturer	Botany
06	Shri. Sanjay Meshram	Sr. Clerk	Administrative Work
07	Shri. Gulab R. Gedekar	Peon	Gardener

PRINCIPAL
Bhiwapur Mahavidyalaya
Bhiwapur, Dist. Nagpur



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1. 3 Environment Audit Team

The study team constituted of the following senior technical executives from **Empirical Exergy Private Limited,**

- ✚ **Mr. Rakesh Pathak,** [Director & Electrical Expert]
- ✚ **Mr. Rajesh Kumar Singadiya** [Director & Accredited Energy Auditor AEA-0284]
- ✚ **Mrs. Laxmi Raikwar Singadiya** [Energy & Chemical Engineer]
- ✚ **Mr. Sachin Kumawat** [Sr. Project Engineer]
- ✚ **Mr. Ajay Nahra** [Engineer]
- ✚ **Mr. Charchit Pathak** [Mechanical Engineer]
- ✚ **Mr. Aakash Kumawat** [Assistant Jr. Engineer]



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1.4 About Environment Auditing

Environment audits can be a highly valuable tool for institute in a wide range of ways to improve their energy, environment and economic performance. while reducing wastages and operating costs. Environment audits provide a basis for calculating the economic benefits of water conservation projects by establishing the current rates of water use and their associated cost.

1.5 Objectives of Environment audit

The general objective of Environment audit is to prepare a baseline report on water conservation measures to mitigate consumption, improve quality and sustainable practices.

The specific objectives are:

-  To monitor the water consumption and water conservation practices.
-  To assess the quantity of water, usage, quantity of waste water generation and their reduction within the college.

1.6 Target Areas of Environment audit

This indicator addresses water sources, water consumption, irrigation, storm water, appliances and fixtures aquifer depletion and water contamination are taking place at unprecedented rates. It is therefore essential that any environmentally responsible institution should examine its water use practices.



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1.7 Methodology followed for conducting Environment audit

Step 1: Walk through survey

- ✚ Understanding of existing water sourcing, storage and distribution facility.
- ✚ Assessing the water demand and water consumption areas/processes.
- ✚ Preparation of detailed water circuit diagram.

Step 2: Secondary Data Collection

- ✚ Analyse historic water use and wastewater generation
- ✚ Field measurements for estimating current water use
- ✚ Metered & unmetered supplies.
- ✚ Understanding of “base” flow and usage trend at site
- ✚ Past water bills
- ✚ Wastewater treatment scheme & costs etc.

Step 3: Site Water Audit Planning (based on site operations and practices)

- ✚ Preparation of water flow diagram to quantify water use at various locations
- ✚ Wastewater flow measurement and sampling plan

Step 4: Conduction of Detailed Water Audit & Measurements

- ✚ Conduction of field measurements to quantify water/wastewater streams
- ✚ Power measurement of pumps/motors
- ✚ Preparation of water balance diagram
- ✚ Establishing water consumption pattern
- ✚ Detection of potential leaks & water losses in the system
- ✚ Assessment of productive and unproductive usage of water
- ✚ Determine key opportunities for water consumption reduction, reuse & recycle.

Step 5: Preparation of Water Audit Report

- ✚ Documentation of collected & analysed water balancing and measurement details
- ✚ Projects and procedures to maximize water savings and minimize water losses.
- ✚ Opportunities for water conservation based on reduce/ recycle/ reuse and recharge options



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**CHAPTER- 2
WATER CONSUMPTION AND WASTE WATER SOURCES**

2.1 Details of Source of Fresh Water and Use Areas:

The main source of freshwater is borewell for the college. The freshwater is mainly used for drinking, housekeeping, gardening, domestic activity and swimming pool tank.

Table 2.1:- Details of source of fresh water and use Areas

Sr. No.	Water sources	Location	Types of water	Application
1	Municipal Water	Academic Building	Fresh water	For drinking
2	Old Borewell	Academic Building	Fresh water	For toilet use
3	New Borewell	Swimming Pool	Fresh water	For swimming pool tank and for toilet

2.2 Water accounting & metering system:

It was observed that there is requirement of water flow meters on borewells to quantify per day ground water extraction from different sources.



Figure 2.2 : - fresh water supply for college campus

2.3 Water Storage Capacity in College Campus: -

There are different type of tank available in college for water storage . Details are given below

Table 2.2 : - Water storage tank in college campus

Sr. No.	Name of Building	Quantity	Capacity (Ltr.)
1	Academic Building	03	5000
2	NX Building	01	20000
3	Indoor Stadium	01	2000
4	Girls Hostel	01	2000
5	Swimming Pool	01	10000

Photographs of water storage tanks.



Figure 2.2 :- Water Storage Tank and capacity of College Campus



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2.4 Water use areas in College Campus: -

Water is preliminary used for drinking, domestic, gardening and activity. Audit team visited various departments and buildings to determine appliances. The details of washroom, toilet and taps are given in table.

Table 2.3 : - water uses areas in the institute campus

Sr. No	Key Water Usage Section	Type of water used (raw, treated, etc.)	Water Consuming activities
1	Admin Block	Fresh Water	Drinking and other uses
2	Hostels	Fresh Water	Drinking, Food cooking, other Uses
3	Institution Buildings	Fresh Water	Drinking and other uses
4	Canteens /Mess	Fresh Water	Food cooking, drinking



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2.5 Fresh Water uses for Gardening:(Sprinkle)

The one of major contribution from fresh water consumption is watering for plants and garden in college campus. College management is already installation of Watering irrigation Dripper's system" for plants. adjustable drip irrigation tools to provide different amounts of water depending on the water requirements of different plants.



Figure 2.3 :- Technology for Drip Water Irrigation for plant



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2.6 Waste Water Generation sources: -

At present waste water generated from various departments canteen, Mess, hostels and clinical activity like washrooms, handwash and washing of medical equipment's and RO rejected etc is discharge into drain line.it should be collect is separate tank and treat in proposed STP.

Sr.no	Location	Drinking	Toilet	Urinal	Hand washing
1	Admin Building	1	8	4	2
2	Academic Building	2	8	12	2
3	Indoor Stadium	0	3	3	2
4	Hostel	4	10	4	9
5	Canteen	1	0	0	1
6	Swimming Pool	0	4	4	2
	Total	8	33	27	18



Figure 2.4 :- Waste water generation sources in college campus.



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END OF THE REPORT
THANKS