

Pre-Feasibility Study

WATER BOTTLING PLANT

Reverse Osmosis



Small and Medium Enterprises Development Authority

Ministry of Industries & Production

Government of Pakistan

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1 INTRODUCTION TO SMEDA

The Small and Medium Enterprise Development (SMEDA) was established with the objective to provide fresh impetus to the economy through the launch of an aggressive SME support program

Since its inception on October 1998, SMEDA has adopted a sectoral SME development approach. A few priority sectors were selected on the criterion of SME presence. In depth research was conducted and comprehensive development plans were formulated after identification of impediments and retardants. The all-encompassing sectoral development strategy involved overhauling of the regulatory environment by taking into consideration other important aspects including finance, marketing, technology and human resource development.

SMEDA has so far successfully formulated strategies for sectors including fruits and vegetables, marble and granite, gems and jewelry, marine fisheries, leather and footwear, textiles, surgical instruments, transport and dairy. Whereas the task of SME development at a broader scale still requires more coverage and enhanced reach in terms of SMEDA's areas of operation.

Along with the sectoral focus a broad spectrum of business development services is also offered to the SMEs by SMEDA. These services include identification of viable business opportunities for potential SME investors. In order to facilitate these investors, SMEDA provides helpdesk services as well as development of project specific documents. These documents consist of information required to make well-researched investment decisions. Sectoral research studies, pre-feasibility studies and business plan development are some of the services provided to enhance the capacity of individual SMEs to exploit viable business opportunities in a better way.

2 PURPOSE OF THE DOCUMENT

The objective of the pre-feasibility study is primarily to facilitate potential entrepreneurs in project identification for investment. The project pre-feasibility may form the basis of an important investment decision and in order to serve this objective; the document/study covers various aspects of project concept development, start-up, production, marketing, finance and business management. The document also provides sectoral information, brief on Government policies and international scenario, which have some bearing on the project itself.

This particular pre-feasibility is regarding production of purified drinking water on commercial basis, which comes under food sector. Before studying the whole document one must consider following critical aspects, which forms the basis of any investment decision.

3 CRUCIAL FACTORS & STEPS IN DECISION MAKING FOR INVESTMENT IN THE PROJECT

Before making any investment decision, it is advisable to evaluate the associated risk factors by taking into consideration certain key elements. For establishing water purification plant critical factors that should be considered before launching are described below:

- The market for purified bottled / mineral water is a growing market, but offers tough competition.
- Perception / positioning of the new brand. Usually the top target market for bottled mineral water follows the perception. If the perception is positive, the results will be higher sales. The positive perception for distributors and final customers may result from direct consumer experience, awareness, direct promotional activities, print media and TV advertising.
- Distribution is very important for the success of new brand. The stronger the distribution the more successful will be the new brand. The distribution strategy should be designed after a careful study of the market for going for regional distribution or for nation wide distribution.
- Pre-launch advertising is vital for positive perception of the product, which will result in higher product acceptance.
- Compliance of the water quality standards of Pakistan Standards & Quality Control Authority (PSQCA) and license from the authority.
- Availability of product at A class, B class or C class shops should be decided before launching the product and availability should be persistent.

3.1 Project Time Lines

S. No	Activity	Time (months)
1	Civil Works	2
2	Plant order and lay out	3
3	Pre-opening operations	1

The construction of civil works has been estimated to be completed in two months and the plant order, lay out and installation is estimated to have a time period of three months. The time required for pre-operations is one month. It also includes pre-launch advertisements on TV and in print media. The project time line may extend and cut back depending upon the start of activities on parallel basis or one after another.

4 PROJECT PROFILE

4.1 Purification of Water

The process of purified bottled water manufacturing consist of collecting water from a suitable source, filtration, demineralization, blending with salts, aeration, testing for standards conformation, bottling and packaging.

A process for the production of bacteria free, clean and palatable bottled water was developed by PCSIR Laboratories complex Karachi. It had very simple process consisting of physical operations of settling, filtration and Ultra Violet radiation treatment. This plant was put into process in 1987. During 1990's much of the mineral water was imported. But today there are more than 26 brands of drinking water available in the market thus showing a substantial growth by the industry.

Table: Mineral Water Imports in Pakistan

Year	Quantity	Value ('000' Rs.)
1992-93	694,249	3,188
1993-94	814,338	5,384
1994-95	1,660,951	10,741
1995-96	2,328,460	12,856

Source: Federal Bureau of Statistics

4.2 Opportunity Rationale

The market for mineral water has been showing a mushroom growth trend over the last few years. The country's market is very small on a global scale and was estimated at 33 million liters a year by the end of 1992. The last three years have shown more growth and the market has been estimated to grow 70 million liters and

the per capita consumption is 0.5 liter. The annual growth rate for bottled water is 40%. According to a study conducted in 2001, Pakistan registered the highest growth of 140% in 2000 amongst the countries in Asia and Middle East region.

The potential markets for bottled / mineral water consist of foreign tourists and foreigners working in Pakistan, hotel industry, patients (bottle water is also used to avoid the possible consumption of contaminated water for the patients) and travelers. Moreover the bottled / mineral water has been emerging as a daily preference of the elite class. Karachi being the biggest city of Pakistan has been facing the problem of drinking water shortage. This further integrates the demand for pure drinking water in Karachi city.

4.3 Project Brief

This proposed project presents an investment opportunity for establishing a bottled water plant for providing pure drinking water. The proposed product line will consist of bottles of 1.5 and 0.5 liters. In the initial phase of the project only 0.5 liters and 1.5 liters bottles will be introduced in the local market. After successful introduction of the new brand of bottled water the product line may be extended to 13 and 19 liters cans.

4.4 Project Investment

The total cost of the project has been worked out to be **Rs.15.066 million**. This includes a fixed cost of Rs.11.485 million and a working capital requirement of Rs.3.580 million. Period of construction is 2 months for civil works and 3 months for machinery & Equipment layout and installation.

4.5 Process

Two sources of water can be used for purification purposes on commercial basis.

- Ground Water
- Water Supply from KWSB (in Karachi)

The ground water option is relatively costly as it involves more treatment. The ground water available on Karachi at different areas has different chemical composition and treatment would vary depending upon the chemical composition from area to area. The water supply from KWSB is more feasible as compared to the ground water available in Karachi. Water can be purchased from KWSB on commercial basis. This feasibility study focuses on KWSB water as source of water.

For the purpose of this feasibility study, two samples of KWSB water has been taken and their chemical composition was analyzed. The chemical analysis of these samples is as following. The cost of purification plant is dependent on the analysis of the available water. The treatment varies from place to place (increase of ground water) and from source to source.

Table: Analysis of KWSB Water

	Source-I	Source-II
pH	7.50	7.62
Conductivity	452 us/cm	492 us/cm
Sulphate	58 ppm	57 ppm
Bicarbonate	107 ppm	111 ppm
Chloride	48 ppm	57 ppm
Magnesium	11 ppm	12 ppm
Calcium	36 ppm	39 ppm
Potassium	6 ppm	6 ppm
Sodium	34 ppm	40 ppm
Total Dissolved Solvents	270 ppm	295 ppm
Total Califon Count	Zero / DL	Zero / DL
Farecal Califon Count	Zero / DL	Zero / DL
Total Bacterial Count	4.0x10 ² cfu/m	4.0x10 ² cfu/m

4.6 Project Capacity Rationale

This study has been made with the focus of Karachi city. Karachi has been facing the problem of water shortage. The population has been growing at the rate of 3.48 annually. The proportion of Urban and rural population in Sindh is 48.8 and 51.2 respectively. It also shows that the major proportion of the population is in the cities and Karachi comes out to be a major target market for new product. The population of Karachi city is 9,339,023 according to 1998 population, which is around 30.69% of the population of Sindh. The sources of drinking water for Sindh region are as following:

Table: Drinking Water Sources

Sources	Pipe (Nul)	Hand Pump	Well	Others
Sindh	41.70	36.51	8.54	13.24
Rural	16.81	52.22	12.78	18.18
Urban	74.53	15.88	2.98	6.76

Source: FBS

Depending on the minimum feasible plant capacity and situation of supply of different brands of purified bottled water and future expansions, a plant size of 15,000 Gallons per day is recommended.

4.7 Proposed Product Mix

This feasibility has been developed for a water purification plant with a capacity of 15,000 gallons per day. The product mix consists of water bottles of 1.5 liters and 0.5 liter in the ratio of 80% and 20% respectively.

Table: Recommended project Parameters

Capacity	Human Resource	Technology/Machinery	Location
15,000 Gallons per day	42	Local + imported	Karachi

4.8 Proposed Business Legal Status

There are three main forms of business: Sole Proprietorship, Partnership and Company. An enterprise can be a proprietorship or a partnership and even it can be registered under company law with corporate law authority. Although selection totally depends upon the choices of an entrepreneur, but this feasibility study has been based on a private limited company.

4.9 Financial Summary

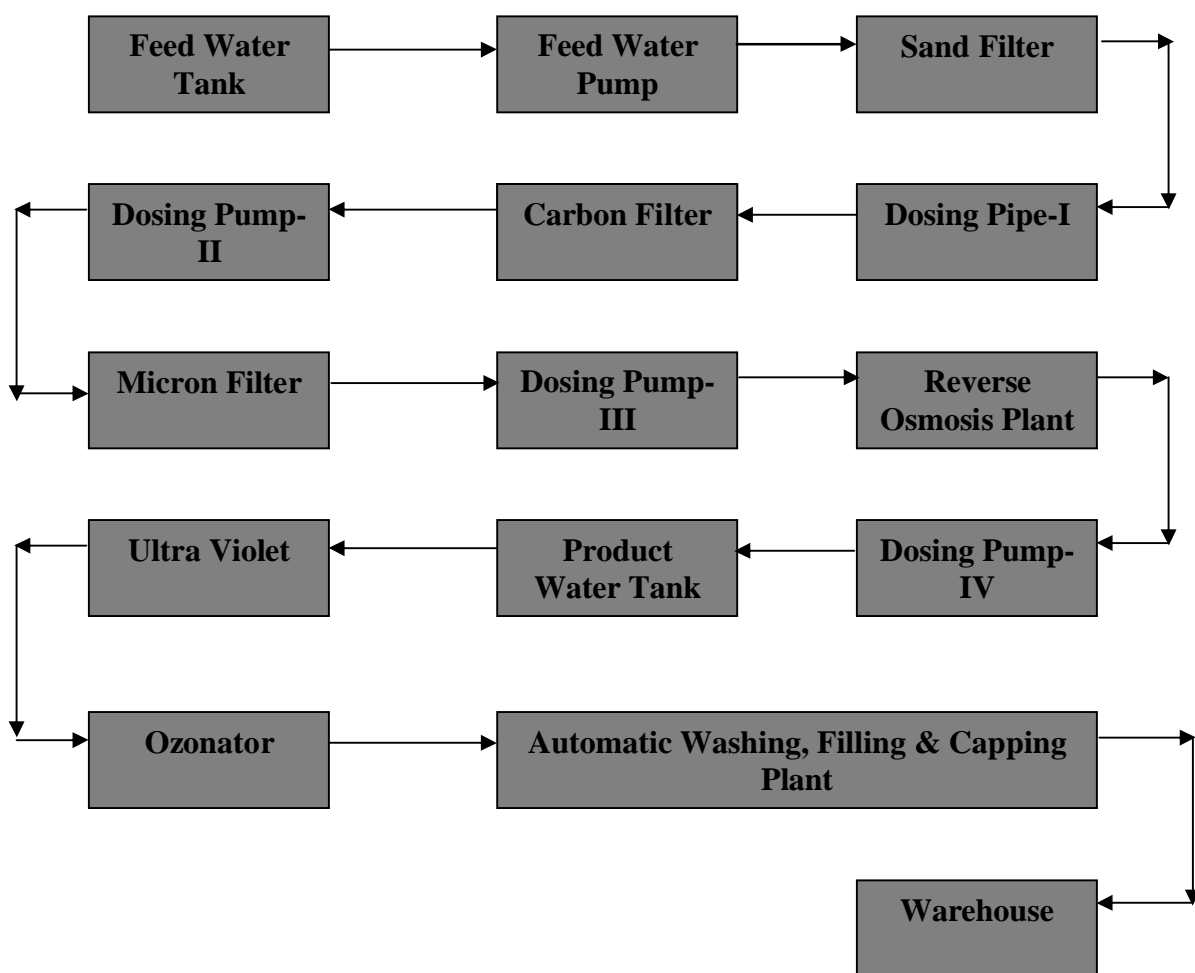
The financial cost of the project can be summarized as under:

Project Cost	IRR	MIRR	Payback Period (yrs)	NPV
15,066,485	79%	37%	2.20	172,652,900

4.10 The process flow

The first step for setting up a water purification plant is the analysis of source of water. After the chemical analysis, the specifications of the purification plant are set. In the purification plant, source water is stored in the feed water tank, passes through the sand filter for preliminary water filtration. Water then passes through the dosing pump-I where chlorine is added to kill the germs in the water. After the chlorination, water passes through carbon filter. It helps in the maintenance of proper odour and taste of the water. It also removes chlorine from water. Water is then passes from

dosing pump-II, where Sodium Meta Bisulphate is added. It helps in dechlorination of water. Water is filtered next and passes through dosing pump-III, where anti scallant is added. It prevents scaling of membrane from calcium, magnesium and biological growth. Water then passes through reverse osmosis module. This stage of the process makes water clear from all the contaminations and minute particles. Water then passes through dosing pump-IV, where minerals are added for taste development. After this stage, water undergoes Ultra Violet treatment to avoid any contamination from bacteria and other micro organisms. Water then passes through automatic washing, filling and capping plant. Here water is filled into bottles. After filling bottles are taken into the warehouse or shipped to the retailers. The complete process flow diagram is as under.



Proposed Location

Any industrial area in Karachi where KWSB water is easily available is ideal for this project.

5 STRATEGIC RECOMMENDATIONS

5.1 Market Entry Timing

The weather is the main dynamic that may bring changes in the market size of the purified drinking water as the daily water requirement increases in summer. When launching a new brand of purified water for bulk market, weather is the main dynamic, which should be given proper consideration. The demand pattern for retail market of purified bottled water is not affected by the weather. The advertisement including TV and print media is expected to bring changes in the demand. However, it is suggested that the new brand of purified bottled water is launched in the start of summer season. The entrepreneur has to match the brand launching time with the advertisement and weather that would drive the demand of bottled water and willingness of consumers to switch towards new brands.

6 KEY SUCCESS FACTOR

6.1 Marketing

Branding and marketing of bottled water is as essential as water for the survival of the human body. The traditional marketing tools include site advertisement, TV and print media advertising and brochures. This study allocates 10% of the revenue for advertising and promotional purposes.

Apart from the traditional marketing tools, this study suggests to focus more on other marketing magnets that include interactive marketing, interactive marketing may include educating the general public about the importance of water and its daily consumption requirements for human body through the participation in seminars and in general public gatherings (e.g. College and University gatherings).

One of the marketing options is to sponsor public events like cricket matches or hospital campaigns, distributing free brochures about water and its daily consumption, water requirements in different age brackets. The interactive marketing may be designed through seminars and workshops about the daily human

consumption requirements and diseases originating from the lack of pure water. Overall marketing strategy may change with the change of target market. A market research study is recommended to design the different dynamics of marketing before launching the new brand.

Marketing expense has been included in the total project cost and it has been estimated around Rs.5 million. The entrepreneur may decide to increase or decrease the amount of marketing expense depending upon this choice of promotion activities and type of media used. Following table gives the breakup of the marketing expense.

	In %age if the marketing expense
TV Advertisement	40%
SITE Advertisement	10%
Newspapers	38%
Magazines	4%
Point of Sales Marketing	8%

6.2 Pricing

The pricing strategy should be in line with the going rate market prices of the different local brands. Since a new brand has to face a lot of competition from the market, it is suggested that the price ceiling should not be crossed whatever price strategy be adopted.

6.3 Product Packaging

Product packaging and presentation is one of the main dynamics, which control the flow of target customers towards the product. Packaging should be inline with the industrial norms. Packaging may also vary with the understanding of the target market. It is suggested that the bottles of 0.5 liter and 1.5 liter capacity should be used. Bottles should be clear. The bottle should give a reflection of light sky blue color, which is considered a natural symbol of the water. This color also adds a tinge of purity. The water should give a shiny and a glossy reflection. The opening of the bottle should be large enough to accommodate outflow and inflow of water. The bottles should be placed in special racks and stand meant for bottled water at retail outlets, which will be having a unique color and a unique design. The color and the design will create a positive perception for the new brand. The wrapper of the bottle is suggested to be on four-color printing and should have the following information in addition to the logo of the company.

- Water Specification
- Certificate mark of the Pakistan Standards & Quality Control Authority

- Expiry Date (Best Before Date)
- A brief intro of the company with the address
- Website address of the company
- Brand Name / Trade Name
- Net volume in System International / Metric system
- Batch number or code number

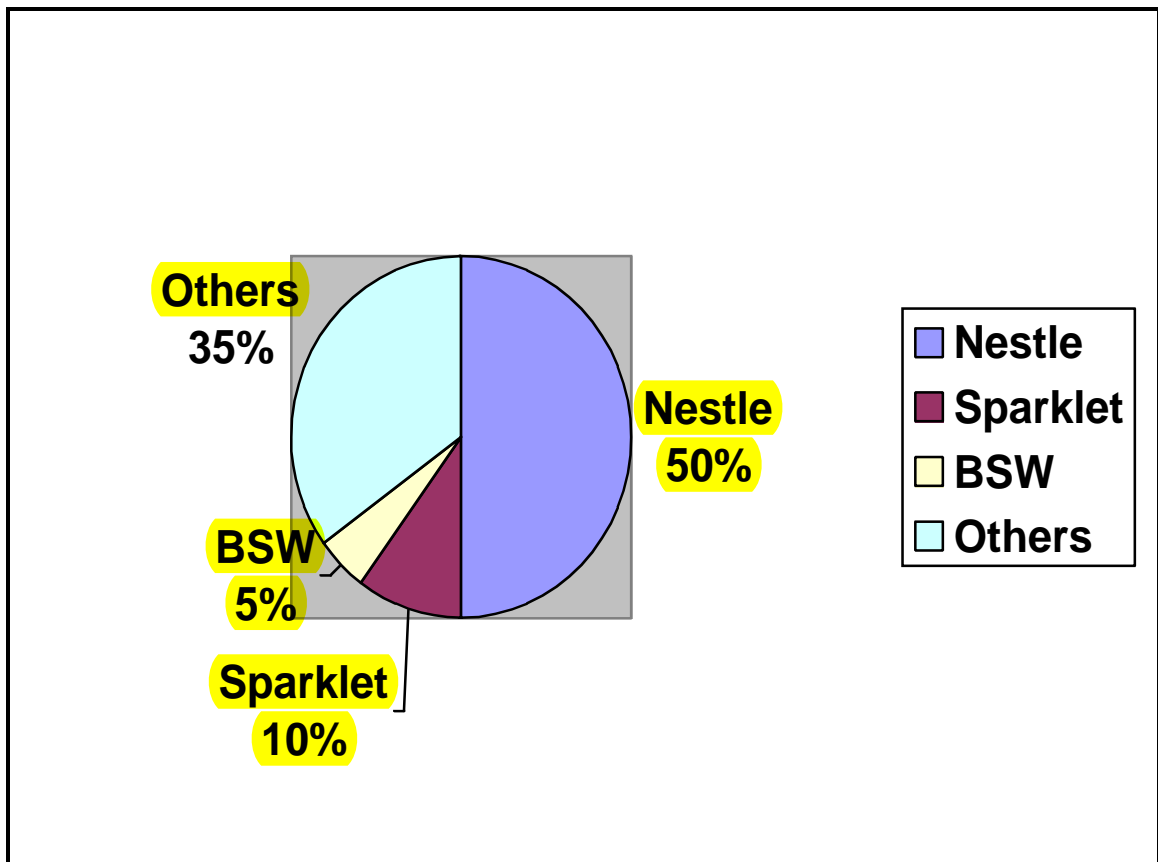
6.4 Availability

In the first phase of the launch of the new brand, availability will also play the key role in attracting the customers. It is suggested that the entrepreneur decides the availability of the product at A-class, or B-class, or C-class retail outlets or mass availability of the product (aggressive marketing). Since, the perception of the product is also directly related with its availability so it is suggested that the strategy for the availability of the product be designed according to the target market and the perception and positioning the entrepreneur is targeting.

7 SECTOR & INDUSTRY ANALYSIS

There are around 26 players in the bottled water sector. According to the industry sources, the number of bottlers scales up well above 70 during summer season due to increased demand for drinking water. However, the much publicized laboratory report published by the Pakistan Council of Research on Water Resources (PCRWR) after conducting a survey of 26 brands in the Rawalpindi and Islamabad region declaring that, all the 26 brands available on the market are contaminated while 10 out of them are unsafe for drinking, forced the Pakistan Standards & Quality Control Authority (PSQCA) to make it obligatory for the companies to obtain license from the authority before commencing operations.

Pakistan's bottled water market comprises of two main segments i.e. retail market and bulk market. The retail market consists of 0.5 liter, 1.5 liter, 3.1 liter and 5.0 liter capacity PET bottles. The bulk market consists of home and office deliveries in 3 and 5 gallon cans.



According to the market figures, the Nestle pure life brand dominates the retail market with market share of 50%. The Sparklet holds 10% of the market share and BSW brand of M/S Wah Valley Corporation has share of 5%. The rest of the market consists of small players.

7.1 Brands Available in the Market

Table: Brands available in the market

Local and Imported Brands Available in the market
Niagra
Nestle Pure
AVA
Sparklets
Masafi
Aqua Safe
Cool
Ab-e-Hayat
Rainbow
Pearl
Asakari
Safa
Zam Zam
Fresh
Musaffa
Mineral Plus
Wellgreen
Aqua Flow
Max Wellpur
Himalaya
Brecorn Carreg
Evian
Perrier
Oslo
Vital
Classic
Blue ever pure
Jeema
Vittel
Gulfa
Volvic

Highland Spring
SPA
Hayat

The price range for 1.5 liter category is from Rs.20-95 including local and imported brands and the price range for 0.5 liter category is from Rs.10-85 for local and imported brands.

7.2 Legal Requirements

The Pakistan Quality Standards defines bottled drinking water as, *“Bottled drinking waters are waters other than natural mineral waters which are filled into hermetically sealed containers of various compositions forms and capacities that is safe and suitable for direct consumption bottled drinking water is considered food.”*

The Pakistan Standard Quality Control Authority (PSQCA) was established under section 3 of the Act-1996. The establishment of any mineral water plant in Pakistan is required to get a license from the Pakistan Standards Quality Control Authority. An application form, which can be obtained for Rs.100 only from the office of the Pakistan Standard Quality Control Authority and it, is to be submitted to the Pakistan Standard Quality Control Authority. The manufacturer is required to have a laboratory and a technical person, who will be checking the samples for constant quality. The team from the Pakistan Standard Quality Control Authority then visits the plant and collects samples. After the conformity of the samples to the standards the Pakistan Standard Quality Control Authority issues a license. The Pakistan Standard Quality Control Authority has developed standards for bottled and mineral water and all the water plants being established in the country are required to follow these standards. A manufacturer could market bottled / mineral water without obtaining a license from the Pakistan Standard Quality Control Authority. The authority examines the availability of proper facilities including standardized laboratory and purification-processing plant for ensuring the quality of purified drinking water with a team of experts. Manufacturing, Stocking and sale of bottled drinking water and bottled mineral water without certification marks license is prohibited under the Pakistan Standard Quality Control Authority Act. Violation of the Pakistan Standard Quality Control Authority Standards is punishable by imprisonment for one year or a fine of Rs.50,000 both.

The general requirements for establishing a bottled / mineral water plant as developed by Pakistan Standard Quality Control Authority are as following:

Suitability

The assessment of the suitability of water for human consumption shall be based on consideration of its physical, chemical and microbiological requirements and limits for toxic substances. The water should be free from all chemical and bacteriological contaminations which are hazardous to health.

Requirements	Units
pH Range	7.0-80
Total Dissolved Solids (TDS) Max	200 mg/L
Total Hardness as CaCO ₃ Max	40 mg/L
Chemical Requirements	
Nitrite (NO ₂)	0.020 mg/L
Chloride	40 mg/L
Sulphate	10 mg/L
Sodium	20 mg/L
Potassium	10 mg/L
Magnesium	5 mg/L
Calcium	20 mg/L
Microbiological Requirements	
Escherichia Coli	0/250 ml
Total Coliform	0/250 ml
Enterococci (Streptococci)	0/250 ml
Sporulated SRA	0/100 ml
Pseudomonas Aeruginosa	0/250 ml
Parasites and pathogenic micro organisms	Shall be free

Hygiene

Drinking water for the purpose of bottling shall be prepared in accordance with PS:3944-1997 for the code of practice-General principle of food Hygiene and in accordance with the PS:4718-2001 for code of practice for the collecting, processing and marketing of natural mineral waters.

Packaging

The containers shall be hygienic suitable completely clean and shall not cause any undesirable change in the tastes, odour or color or quality of the water. It shall be packed in hermetically sealed containers of Food Grade material to prevent contamination of bottled water. Filling and sealing operations of containers shall be done in an aseptic atmosphere so as to prevent any contamination.

Transportation

Bottled water shall be transported by any suitable means of transport to protect it from contamination.

Marking

In addition to the PS:1485-1994 ® for Pakistan Standard for the labeling of Pre-Packaged Foods, the following provisions shall apply.

- a) Name of the product for example bottled drinking water
- b) Brand name or trade name
- c) Net volumes in System International / Metric System
- d) Name and address of the manufacturer
- e) Batch number or Code number
- f) Date of Expiry
- g) Chemical composition e.g. Sulphate, Magnesium, Potassium etc.
- h) Pakistan Standard number

Sampling

- In any consignment all the bottles of the same size and belonging to one batch of the manufacturer or supply shall constitute a **LOT**
- Each bottle of the sample shall be marked with necessary details of sampling and the bottles for bacteriological testing shall be marked separately
- The bottles of the sample shall be stored in such a manner that there shall be no deterioration of quality of water
- The bottles for bacteriological testing shall be brought to the testing laboratory within one hour, of sampling. If this is not possible the bottles shall be stored at 10 °C or below and transported to the testing laboratory within 24 hours. In case of small units, the original packing shall be treated as sample.

Scale of Sample

Sample shall be tested from each lot for ascertaining its conformity to the requirements of this specification. The number of bottles to be selected from a lot shall be in accordance with the following table.

Table: R-1

Number of Bottles in the Lot	Number of bottles to be selected
Up to 1000	15
1001 to 3000	17
3001 to 10,000	18
10,001 and above	24

R-2: If bottles are packed in cases, 10 percent of the cases subject to minimum of five cases shall be selected from the lot and as far as possible an equal number of bottles shall be selected from each case so selected to form a sample of sizes given in the table **R-1**.

Number of Test

- A. Each bottle selected as in R-1 and R-2 shall be inspected for packaging and marking requirements
- B. The bottle shall be selected from the bottles, selected as in R-1 and R-2 and tested individually for bacteriological limits
- C. A sufficiently quantity of water shall be drawn from each of the remaining bottles and mixed to form a composite sample thus obtained shall be tested for the requirements for its suitability and chemical composition

Criteria for Conformity

A **LOT** shall be declared as conforming to the requirements of this specification, if the following conditions are satisfied.

- Each bottle inspected as “**A**” satisfies the relevant requirements
- Each bottle when tested as in “**B**” satisfies the relevant information
- Composite sample when tested as in “**C**” satisfies the relevant requirements

Government of Pakistan as initiated steps to launch programs against substandard bottled water. The Pakistan Council of Research on Water Resources (PCRWR) has launched a campaign against substandard and unlicensed brands of mineral water being sold in the market. The PCRWR has a conducted a serried of tests of 21 brands of mineral water last year and 11 were found contaminated and some of them substandard. It is recommended to fulfill all the requirements of the Pakistan Quality Control Authority for getting a license for the production and marketing of bottled / mineral water in Pakistan.

8 MACHINERY & EQUIPMENT REQUIREMENTS

Most of the water purification plants being installed in the country are reverse osmosis based. Government also recommends the RO based technology. This pre-feasibility study is based on the reverse osmosis plant. The details of the machinery & equipment are as following.

Table: Machinery Details in Rs.

Machinery Name	Quantity	Unit Cost (Rs.)	Total Cost
Reverse Osmosis Water purification plant	1	1,495,000	1,495,000
Ozonator (included in the filling plant)	1	-	-
Washing, Filling & Capping Plant (inclusive of sales tax)	1	2,645,000	2,645,000
Washing, Filling & Capping Plant (inclusive of sales tax)	1	2,070,000	2,070,000
UV Lamp (included in the RO Plant)	1	30,000	30,000
Total			6,240,000

9 HUMAN RESOURCE REQUIREMENT

The following requirement of staff along with their levels and monthly salary is foreseen for this project.

Table: Human Resource Requirement

Designation	No. of Staff	Monthly Salary	Annual Cost
CEO	1	50,000	600,000
Admin & Accounts Manager	1	30,000	360,000
Area Sales Manager	1	40,000	480,000
Sales Supervisor	2	30,000	360,000
Sales Rep	25	10,000	3,000,000
Driver	2	20,000	240,000
Washer	1	9,000	108,000
Filler	2	15,000	180,000
Laoder	2	15,000	180,000
Plant Helper	1	8,000	96,000
Packing Supervisor	1	8,000	96,000
Marketing Manage	1	30,000	360,000
Marketing Officer	1	15,000	180,000
Watchman	1	5,000	60,000
Total	42		6,300,000

10 LAND & BUILDING REQUIREMENTS

For the proposed set up of water purification plant, a total of 2050 square feet is required. This land requirement includes space for the installation of plant and machinery, management office and store for bottles, finished product and parking.

Table: Covered Area Requirement

Space Requirement	Required Area (Sq.ft)
Bottle Storage Room (50,000 bottles)	400
Bottle Washing & Mineral Water plant	200
Conveyer belt & finished product packing	300
Finished product storage room	350
Management office	500
Parking	300
Total Area	2050

Table: Total Land Cost & Construction Cost

Total Land	Cost (Rs.)
2050 Square feet	1,230,000
Covered Area Requirement	2050
Time required for civil works	2 months
Construction Cost	
Management building 500 sq.ft @ Rs.600	300,000
Factory 900 sq.ft @ Rs.600	540,000
Stores 350 sq.ft @Rs.600	210,000
Parking 300 sq.ft @Rs.25	7,500
Total Construction Cost	1,057,500

10.1 Recommended Mode of Land Acquisition

Since purified bottled water is a kind of project, which needs an extended span of time for its perception and brand recognition, so the recommended mode for the acquisition of land owned or leased (100 years).

10.2 Suitable Location

This project has been developed with a focus of Karachi city. The appropriate location would be any industrial area of Karachi city where KWSB water is available along with other infrastructure facilities.

Table: Furniture & Fixture

Workstation	Quantity	Cost per unit (Rs.)	Total Cost (Rs.)
Table & Chair for CEO	1	9,600	9,600
Table & Chairs for Manager	3	8,000	24,000
Table & Chairs for Officers & Supervisors	3	5,500	16,500
Table & Chairs for other staff	10	4,400	44,000
Visitors Chairs for Management office	13	800	10,400
Other Staff chairs	10	400	4,000
Total	40		108,500

Table: Office Equipment Requirements

Equipment	Quantity	Cost per unit (Rs.)	Total Cost (Rs.)
Computer	4	22,000	88,000
Laser Printer	1	10,000	10,000
Dot Matrix	1	15,000	15,000
UPS	4	8,500	34,000
Air Conditioner	4	15,000	60,000
Total	14		207,000

11 FINANCIAL ASSUMPTIONS

Table: Project

Capital Investment	Rs. In actual
Land	1,230,000 (not included in financing)
Building / Infrastructure	1,057,500
Machinery & Equipment	6,240,000
Furniture & Fixture	108,500
Office Vehicles	2,056,360
Office Equipment	202,500
Pre-operating Cost	1,816,268
Total Capital Costs	11,485,628

Table: Means of Financing

Initial Financing	Rs. In actual
Debt	9,039,891
Equity	6,026,594
Total Investment	15,066,485

12 KEY ASSUMPTIONS

Table: Project Assumption

Period of construction & machinery installation (months)	6
Total Covered Are	2050
Projected life of the project	10

Table: Operating Assumption

No. of working days in one year	330
No. of working hours in one day	8

Table: Revenue Assumption

Plant Capacity liters per day	2,363
Production per year (liters)	18,711,000
Ratio of 1.5 liter and 0.5 liter bottle	80:20
Production of 1.5 liter bottle	9,979,200
Production of 0.5 liter bottle	7,484,4000
Total annual production	17,463,600
Sale price of 1.5 liter bottle (Rs.)	15
Sale price of 0.5 liter bottle (Rs.)	8
Capacity utilization in first yr	60%
Sales price growth rates	10%
Production capacity utilization growth rate	10%
Maximum Capacity utilization	95%

Table: Financial Assumption

Debt	60%
Equity	40%
Interest Rate	12%
Interest Rate on short term debt	16%
Interest on cash in bank	0.02%
Corporate tax rate	41%
Turnover tax rate	1%
Dividend rate	50%
Required rate of return on equity	25%
WACC	15%
Down payment on machinery & Equipment leased	20%
Interest rate on machinery & Equipment	22%

leased	
Down payment on office equipment leased	20%
Interest rate on office equipment leased	22%
Down payment on vehicles leased	20%
Interest rate on office vehicles leased	22%

Table: Expense Assumption

Description	Cost / Rate
Cost of goods sold growth rate	5.0%
Operating costs growth rate	5.0%
Administration benefits expense	3.0%
Traveling expense	3.0%
Communication expense	2.0%
Office Vehicles running expense	5.0%
Office expenses (stationary, entertainment, janitorial services etc.)	1.0%
Promotional expense	10.0%
Machinery & equipment insurance rate	2.0%
Office vehicles insurance rate	3.0%
Professional fees (legal, audit, consultants etc.)	0.5%
Bad debt expense	3.0%

Table: Description Expense

Description Method	Straight Line
Machinery & Equipment	10%
Office Furniture & Fixture	10%

13 FINANCIAL STATEMENTS

13.1 Projected Income Statement

Statement Summaries										SMEDA
Income Statement										
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Rs. in actuals Year 10
Revenue	120,498,840	160,675,515	197,276,310	245,893,725	285,010,110	310,477,860	344,843,730	377,234,550	411,600,420	453,076,470
Cost of goods sold	84,788,954	98,770,363	118,043,800	142,077,487	157,506,067	165,993,576	174,844,635	184,192,000	194,065,726	204,497,881
Gross Profit	35,709,886	61,905,152	79,232,510	103,816,238	127,504,043	144,484,284	169,999,095	193,042,550	217,534,694	248,578,589
<i>General administration & selling expenses</i>										
Administration expense	12,854,400	7,052,961	7,739,648	8,493,191	9,320,100	10,227,518	11,223,283	12,315,998	13,515,101	14,830,950
Rental expense	-	-	-	-	-	-	-	-	-	-
Utilities expense	428,292	471,122	518,234	570,057	627,063	689,769	758,746	834,621	918,083	1,009,891
Travelling & Comm. expense (phone, fax, etc.)	624,000	342,377	375,711	412,291	452,432	496,481	544,820	597,864	656,073	719,949
Office vehicles running expense	102,818	113,100	124,410	136,851	150,536	165,589	182,148	200,363	220,400	242,439
Office expenses (stationary, etc.)	124,800	68,475	75,142	82,458	90,486	99,296	108,964	119,573	131,215	143,990
Promotional expense	12,049,884	16,067,552	19,727,631	24,589,373	28,501,011	31,047,786	34,484,373	37,723,455	41,160,042	45,307,647
Insurance expense	186,491	161,673	136,854	112,036	87,218	161,754	129,403	97,052	64,701	32,351
Professional fees (legal, audit, etc.)	-	-	-	-	-	-	-	-	-	-
Depreciation expense	1,119,697	1,119,697	1,119,697	1,119,697	1,119,697	1,370,783	1,370,783	1,370,783	1,370,783	1,370,783
Amortization expense	363,254	363,254	363,254	363,254	363,254	-	-	-	-	-
Property tax expense	-	-	-	-	-	-	-	-	-	-
Miscellaneous expense	3,614,965	4,820,265	5,918,289	7,376,812	8,550,303	9,314,336	10,345,312	11,317,037	12,348,013	13,592,294
Subtotal	31,468,601	30,580,475	36,098,870	43,256,019	49,262,100	53,573,312	59,147,832	64,576,745	70,384,410	77,250,294
Operating Income	4,241,285	31,324,677	43,133,640	60,560,219	78,241,943	90,910,972	110,851,263	128,465,805	147,150,285	171,328,295
Other income	25	97	543	1,417	2,210	3,135	4,620	6,250	7,883	10,907
Gain / (loss) on sale of assets	-	-	-	-	822,544	-	-	-	-	-
Earnings Before Interest & Taxes	4,241,310	31,324,774	43,134,183	60,561,636	79,066,697	90,914,108	110,855,883	128,472,055	147,158,168	171,339,202
Interest expense	1,520,031	1,303,476	609,200	387,712	204,829	-	-	-	-	-
Earnings Before Tax	2,721,279	30,021,298	42,524,983	60,173,925	78,861,868	90,914,108	110,855,883	128,472,055	147,158,168	171,339,202
Tax	1,115,724	12,308,732	17,435,243	24,671,309	32,333,366	37,274,784	45,450,912	52,673,542	60,334,849	70,249,073
NET PROFIT/(LOSS) AFTER TAX	1,605,555	17,712,566	25,089,740	35,502,615	46,528,502	53,639,324	65,404,971	75,798,512	86,823,319	101,090,129
Balance brought forward	-	1,605,555	9,659,060	17,374,400	26,438,508	36,483,505	45,061,414	55,233,193	65,515,852	76,169,586
Total profit available for appropriation	1,605,555	19,318,120	34,748,800	52,877,016	72,967,010	90,122,828	110,466,385	131,031,705	152,339,172	177,259,715
Dividend	-	9,659,060	17,374,400	26,438,508	36,483,505	45,061,414	55,233,193	65,515,852	76,169,586	88,629,858
Balance carried forward	1,605,555	9,659,060	17,374,400	26,438,508	36,483,505	45,061,414	55,233,193	65,515,852	76,169,586	88,629,858

13.2 Projected Balance Sheet

Statement Summaries											SMEDA
Balance Sheet											Rs. in actuals
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Assets											
<i>Current assets</i>											
Cash & Bank	250,000	-	966,160	4,459,235	9,708,852	12,391,628	18,963,121	27,237,428	35,261,871	43,572,540	65,495,630
Accounts receivable	-	9,904,014	11,555,110	14,710,349	18,212,467	21,817,966	24,472,108	26,931,024	29,674,450	32,417,875	35,534,667
Finished goods inventory	-	3,686,476	4,140,075	4,944,243	5,947,430	6,577,176	6,916,399	7,285,193	7,674,667	8,086,072	8,520,745
Equipment spare part inventory	4,184	5,468	6,891	8,550	9,960	10,992	12,119	13,361	14,730	16,240	-
Raw material inventory	3,140,182	4,081,778	5,144,162	6,381,450	7,431,714	8,198,724	9,039,093	9,965,600	10,987,074	12,113,249	-
Pre-paid annual land lease	-	-	-	-	-	-	-	-	-	-	-
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Pre-paid insurance	186,491	161,673	136,854	112,036	87,218	161,754	129,403	97,052	64,701	32,351	-
Total Current Assets	3,580,857	17,839,409	21,949,253	30,615,864	41,397,641	49,158,240	59,532,243	71,529,659	83,677,494	96,238,327	109,551,042
<i>Fixed assets</i>											
Land	-	-	-	-	-	-	-	-	-	-	-
Building/Infrastructure	1,057,500	1,004,625	951,750	898,875	846,000	793,125	740,250	687,375	634,500	581,625	528,750
Machinery & equipment	6,240,000	5,616,000	4,992,000	4,368,000	3,744,000	3,120,000	2,496,000	1,872,000	1,248,000	624,000	-
Furniture & fixtures	108,500	97,650	86,800	75,950	65,100	54,250	43,400	32,550	21,700	10,850	-
Office vehicles	2,056,360	1,645,088	1,233,816	822,544	411,272	3,311,788	2,649,431	1,987,073	1,324,715	662,358	-
Office equipment	207,000	186,300	165,600	144,900	124,200	103,500	82,800	62,100	41,400	20,700	-
Total Fixed Assets	9,669,360	8,549,663	7,429,966	6,310,269	5,190,572	7,382,663	6,011,881	4,641,098	3,270,315	1,899,533	528,750
<i>Intangible assets</i>											
Pre-operation costs	1,816,268	1,453,014	1,089,761	726,507	363,254	-	-	-	-	-	-
Legal, licensing & training costs	-	-	-	-	-	-	-	-	-	-	-
Total Intangible Assets	1,816,268	1,453,014	1,089,761	726,507	363,254	-	-	-	-	-	-
TOTAL ASSETS	15,066,485	27,842,087	30,468,980	37,652,640	46,951,466	56,540,903	65,544,124	76,170,757	86,947,809	98,137,860	110,079,792
Liabilities & Shareholders' Equity											
<i>Current liabilities</i>											
Accounts payable	-	6,538,523	8,101,958	9,741,516	11,500,258	12,751,604	13,432,756	14,143,450	14,893,683	15,685,840	15,423,341
Export re-finance facility	-	-	-	-	-	-	-	-	-	-	-
Short term debt	-	5,226,383	-	-	-	-	-	-	-	-	-
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Total Current Liabilities	-	11,764,906	8,101,958	9,741,516	11,500,258	12,751,604	13,432,756	14,143,450	14,893,683	15,685,840	15,423,341
<i>Other liabilities</i>											
Lease payable	-	-	-	-	-	-	-	-	-	-	-
Deferred tax	-	1,115,724	1,279,200	1,279,200	1,279,200	1,279,200	1,023,360	767,520	511,680	255,840	(0)
Long term debt	9,039,891	7,329,307	5,402,168	3,230,930	1,706,906	-	-	-	-	-	-
Total Long Term Liabilities	9,039,891	8,445,031	6,681,368	4,510,130	2,986,106	1,279,200	1,023,360	767,520	511,680	255,840	(0)
<i>Shareholders' equity</i>											
Paid-up capital	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594	6,026,594
Retained earnings	-	1,605,555	9,659,060	17,374,400	26,438,508	36,483,505	45,061,414	55,233,193	65,515,852	76,169,586	88,629,858
Total Equity	6,026,594	7,632,149	15,685,654	23,400,994	32,465,102	42,510,099	51,088,008	61,259,787	71,542,446	82,196,180	94,656,452
TOTAL CAPITAL AND LIABILITY	15,066,485	27,842,087	30,468,980	37,652,640	46,951,466	56,540,903	65,544,124	76,170,757	86,947,809	98,137,860	110,079,792
Note: Total assets value will differ from project cost due to first installment of leases paid at the start of year 0											

13.3 Projected Cash Flow Statement

Statement Summaries											SMEDA
Cash Flow Statement											
	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
											Rs. in actuals
Operating activities											
Net profit	-	1,605,555	17,712,566	25,089,740	35,502,615	46,528,502	53,639,324	65,404,971	75,798,512	86,823,319	101,090,129
Add: depreciation expense	-	1,119,697	1,119,697	1,119,697	1,119,697	1,119,697	1,370,783	1,370,783	1,370,783	1,370,783	1,370,783
amortization expense	-	363,254	363,254	363,254	363,254	363,254	-	-	-	-	-
Deferred income tax	-	1,115,724	163,476	-	-	-	(255,840)	(255,840)	(255,840)	(255,840)	(255,840)
Accounts receivable	-	(9,904,014)	(1,651,096)	(3,155,238)	(3,502,118)	(3,605,499)	(2,654,143)	(2,458,916)	(2,743,426)	(2,743,426)	(3,116,791)
Finished good inventory	-	(3,686,476)	(453,599)	(804,168)	(1,003,187)	(629,747)	(339,223)	(368,794)	(389,474)	(411,405)	(434,673)
Equipment inventory	(4,184)	(1,284)	(1,424)	(1,658)	(1,411)	(1,032)	(1,127)	(1,242)	(1,369)	(1,510)	16,240
Raw material inventory	(3,140,182)	(941,596)	(1,062,384)	(1,237,288)	(1,050,263)	(767,010)	(840,369)	(926,507)	(1,021,474)	(1,126,175)	12,113,249
Pre-paid building rent	-	-	-	-	-	-	-	-	-	-	-
Pre-paid lease interest	-	-	-	-	-	-	-	-	-	-	-
Advance insurance premium	(186,491)	24,818	24,818	24,818	24,818	(74,535)	32,351	32,351	32,351	32,351	32,351
Accounts payable	-	6,538,523	1,563,434	1,639,558	1,758,742	1,251,346	681,151	710,694	750,232	792,158	(262,500)
Other liabilities	-	-	-	-	-	-	-	-	-	-	-
Cash provided by operations	(3,330,857)	(3,765,799)	17,778,742	23,038,714	33,212,148	44,184,976	51,632,907	63,507,499	73,540,295	84,480,255	110,552,948
Financing activities											
Change in long term debt	9,039,891	(1,710,584)	(1,927,139)	(2,171,238)	(1,524,023)	(1,706,906)	-	-	-	-	-
Change in short term debt	-	5,226,383	(5,226,383)	-	-	-	-	-	-	-	-
Change in export re-finance facilit	-	-	-	-	-	-	-	-	-	-	-
Add: land lease expense	-	-	-	-	-	-	-	-	-	-	-
Land lease payment	-	-	-	-	-	-	-	-	-	-	-
Change in lease financing	-	-	-	-	-	-	-	-	-	-	-
Issuance of shares	6,026,594	-	-	-	-	-	-	-	-	-	-
Purchase of (treasury) shares	-	-	-	-	-	-	-	-	-	-	-
Cash provided by / (used for) financ	15,066,485	3,515,799	(7,153,522)	(2,171,238)	(1,524,023)	(1,706,906)	-	-	-	-	-
Investing activities											
Capital expenditure	(11,485,628)	-	-	-	-	(3,311,788)	-	-	-	-	-
Acquisitions	-	-	-	-	-	-	-	-	-	-	-
Cash (used for) / provided by invest	(11,485,628)	-	-	-	-	(3,311,788)	-	-	-	-	-
NET CASH	250,000	(250,000)	10,625,220	20,867,476	31,688,124	39,166,282	51,632,907	63,507,499	73,540,295	84,480,255	110,552,948
Cash balance brought forward		250,000	-	966,160	4,459,235	9,708,852	12,391,628	18,963,121	27,237,428	35,261,871	43,572,540
Cash available for appropriation	250,000	-	10,625,220	21,833,635	36,147,360	48,875,133	64,024,536	82,470,621	100,777,724	119,742,126	154,125,488
Dividend	-	-	9,659,060	17,374,400	26,438,508	36,483,505	45,061,414	55,233,193	65,515,852	76,169,586	88,629,858
Cash carried forward	250,000	-	966,160	4,459,235	9,708,852	12,391,628	18,963,121	27,237,428	35,261,871	43,572,540	65,495,630