PRE FEASIBILITY REPORT

Expansion through Modernization

Of

Existing Manufacturing Unit

of

M/s. Saurashtra Chemicals
Division of Nirma Ltd

Located at:
Birlasagar,Village: Chhaya,
Taluka & District: Porbandar, Gujarat

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1. Introduction

M/s Saurashtra Chemicals Division of Nirma Ltd., having its registered office at Birlasagar, Porbandar–360576, was incorporated under Indian Companies Act-1931, on 22nd August, 1951, as Salt and Allied Industries Limited. Its name was changed to Birla Salt and Chemicals Limited vide fresh certificate of incorporation dated 15th September, 1989. Subsequently, its name was changed to Saurashtra Chemicals Limited (Saukem) vide fresh certificate of incorporation consequent on change of name, issued by the registrar of companies, Gujarat on 25th March, 1999.

The company was taken over by the Nirma Group, in the February 2006, as Sick Company, classified & declared by Board of Industrial and Financial Reconstruction (BIFR). As per the Scheme, the appointed date of amalgamation is 1st April, 2011. From this date, all the assets and liabilities of SCL have been transferred and vested into Nirma Ltd. The scheme has become effective from 9th February 2013. Consequent upon the amalgamation, the erstwhile SCL would now be recognized as "M/s Saurashtra Chemicals Division of Nirma Limited".

The company has manufacturing facilities at Birlasagar, Porbandar, in the State of Gujarat since 1955, where it manufactures Soda Ash (Light and Dense), Sodium Bicarbonate (refined and Technical Grade). The company is using Solvay Method of soda ash production.

2. Brief description of nature of the project

M/s Saurashtra Chemicals, Division of Nirma Ltd., is an existing Soda Ash manufacturing industry located at Birlasagar, Village; Chhaya, Taluka & District: Porbandar, Gujarat. Existing industry is engaged in manufacturing of Soda Ash (Light and Dense), Sodium Bicarbonate as well as have own its Co-GenerationPower Plant. As described in above paragraph,existing unit was established in year 1955 and its major plant machinery needs more maintenance as well as required to be replaced. Therefore, in order to increase efficiency of existing unit, industry is now planning to carry out technological up gradation in their exiting unit and expand their existing production capacity.

Now, M/s. Saurashtra Chemicals, Division of Nirma Ltd likes togo for expansion through modernization in existing production capacity which falls under project activity item no. 4 (e) and 1(d) in category "A" with applicability of general condition as stated in EIA Notification dated 14th September 2006 and hence the project proponent has to obtain the Environmental Clearance from IA Division (industry-2), MoEF&CC, New Delhi. The proposal attracts General Condition of EIA Notification, 2006 as Porbandar Bird Sanctuary notified under Wildlife (Protection) Act, 1972 is located within 5 km. Therefore, as per requirements of the notification, an application has been submitted to IA Division (industry-2) along with Form-1, Pre-feasibility report and draft Terms of Reference (ToR).

3. Project Description

(i) Location

The existing industry is located at coordinates 21°37'39.19" N 69°37'34.06" E and proposed modernisation will be carried out within the existing premises of M/s. Saurashtra Chemicals Division of Nirma Limited.

Source: Google Earth

Geographic Coordinates:

A	21°37'49.65"N	69°37'13.68"E
B	21°37'54.91"N	69°37'24.98"E
C	21°37'29.69"N	69°37'47.85"E
D	21°37'17.17"N	69°37'30.67"E

Salient features in the surroundings area of the proposed site within 10 km radius are as follows:

Sr. No.	Important Features	Description
1	Location of Proposed Project	M/s Saurashtra Chemicals (Division of Nirma Ltd.) Birlasagar, Village: Chhaya, Taluka & District: Porbandar
2	Corporate office address	**NIRMA LIMITED,**Nirma House, Ashram Road, Ahmedabad – 380 009, Gujarat – India. Phone: +91-79-27549000 Fax : +91-79-27546603 / 05 E- mail: info@nirma.co.in
4	MSL	11 m
5	Temperature range	10°C to 43 °C
6	Annual Rain fall	551 mm
7	Nearest power station	Paschim Gujarat Vij Company Limited (PGVCL), Porbandar
8	Nearest Road	NH 8E adjacent to project site
9	Nearest Railway station	Porbandar @ 1.41 Km
10	Nearest Air Port	Porbandar @ 3.33 km
11	Nearest Sea Port	Porbandar Port @ 3.0Km in W
12	Nearest Town	Porbandar
13	Nearest Village	Chhaya
14	Seismic Zone	Zone-III (Less Active)
15	National Parks / Sanctuary	Porbandar Bird Sanctuary @ 885 meters in N

(ii) Alternative Sites considered

Not required because unit is existing and prosed expansion will be carried out within premises of existing unit. Therefore, no other site is considered.

(iii) Size or magnitude of operation:

A detail of production capacity of existing products as well as proposed expansion is given in table below. Existing industry has been granted consent to operate from GPCB.

List of Proposed Products

Sr. No.	Name of Product	Existing as per Consent MT/Month	Proposed Expansion MT/Month	Total production Capacity after expansion MT/Month
1.	Soda Ash(Light)	35,720	9,300	45,020
2.	Soda Ash(Dense)	5100	0	5100
3.	Caustic Lye (100 %)	620	0	620
4.	Sodium Bi-Carbonate	1800	600	2400
5.	Liquid Bromine	20	0	20
6.	Power (Co-generation Plant)	20 MW	20 MW	40 MW

(iv) Project description with process details

Details of manufacturing process are given in ***Annexure- 6 of Form- 1***.

(v) Raw material required along with estimated quantity

Details of raw material and its consumption are given in ***Annexure- 5 of Form- 1***.

(vi) Resource optimization/ recycling and reuse envisaged inthe project, if any, should be briefly outlined.

Water Conservation Steps to be followed after proposed expansion:
Water conservation practice will remain same as existing. Effluent is diluted up to 10 time with the addition of once through cooling water and scrubber waste water. After conforming the stipulated norms, effluent is being disposed of about 270 mt inside the Arabian sea through diffuser system.

Saukem has Sea Water Reverse Osmoses (SWRO) technology to prepare fresh water with capacity of 12.4 MLD and after expansion capacity will be 17.4 MLD. Reject water from SWRO is being reused in Scrubber system at KILN area. Reject water from Scrubber system is again being reused for dilution of main Effluent.

Saukem has desalination plant with capacity of 1.680 MLD. Vapour from Distillate effluent is being reused for making up of fresh water through this vapour condensate System.

Waste Minimization: Saukem has adopted the green concept of 5 R's (Refuse, reduce, reuse, recycle recover).

- Lime stone dust (0-3mm) recovered from screening and reuse in the Boilers as a sweetener to minimize the SOx load in the Air.
- Lime stone undersize (below 20mm) recovered from screening and being sold to Cement industries as a raw material.
- Hard Coke dust recovered from screening is being reused for making briquettes as Briquettes is used for fuel in place of hard coke in the KILN.
- Fly ash generated from the Cogeneration power plant and same have been sold to cement companies and brick manufacturing units to use as a raw material.
- Grit refeed (unreacted sized lime stone) generated from slaker is reused in kiln.
- Grit Reject (waste) generated from the slaker is sold for reuse in construction activities.
- Solid waste i.e. sand, unburned lime, clay, etc. generated from the effluent line is collected and reused for filling the low lying area.

(vii) Availability of water its source, Energy/ power requirement and source should be given.

SEA WATER CONSUMPTION:

Currently, the Water requirement of existing industry is met through the seawater, which is mainly for cooling as well as for desalination plant i.e. RO/DM plants. The water from RO/DM plant is used in domestic, manufacturing and other process. Sea water intake is located near project site. There will not be increase in water consumption after the proposed expansion and hence total quantity of seawater requirement will not increase from consented quantity.

In the existing industry cooling water system is of "once through" type. No ground water and surface water (terrestrial i.e. river, pond, lake etc.) extraction is envisaged for proposed expansion activities.

Seawater Intake Locations:
Latitude: 21° 37'13.55" N
Longitude: 69° 37'04.93" E

(viii) Quantity of wastes to be generated (liquid and solid) and scheme for their Management/disposal

- **Hazardous Waste Generation and Disposal**
  Details of hazardous waste generation and its disposal are given in ***Annexure-12 of Form- 1***.

- **Wastewater Generation and Disposal Facility**

  Domestic waste water is disposed off through septic tank/soak pit system.

  Effluent generated from process is being diluted more than 10 times through fresh sea water along with once through cooling Seawater of the Soda Ash Plant to bring down the temperature as well as reduce concentration of suspended solids.

  Cooling water for CPP is being reused up to 10735 KLD.

  Online monitoring systems for temperature, pH and Ammonical Nitrogen have been provided at effluent line.

  pH of the effluent is controlled by direct passing CO2 gas (40%) and HCl solution in the effluent channel line.

  Treated effluent travels within plant through an open constructed channel of 1.3 km, followed by 270 mtrs submerged pipeline. This 270 mtrs pipeline (2 Nos. x 900 mm dia) with a diffuser system for proper dispersion is laid submerged in the Arabian Sea.

1. Site Analysis

(i) Connectivity:

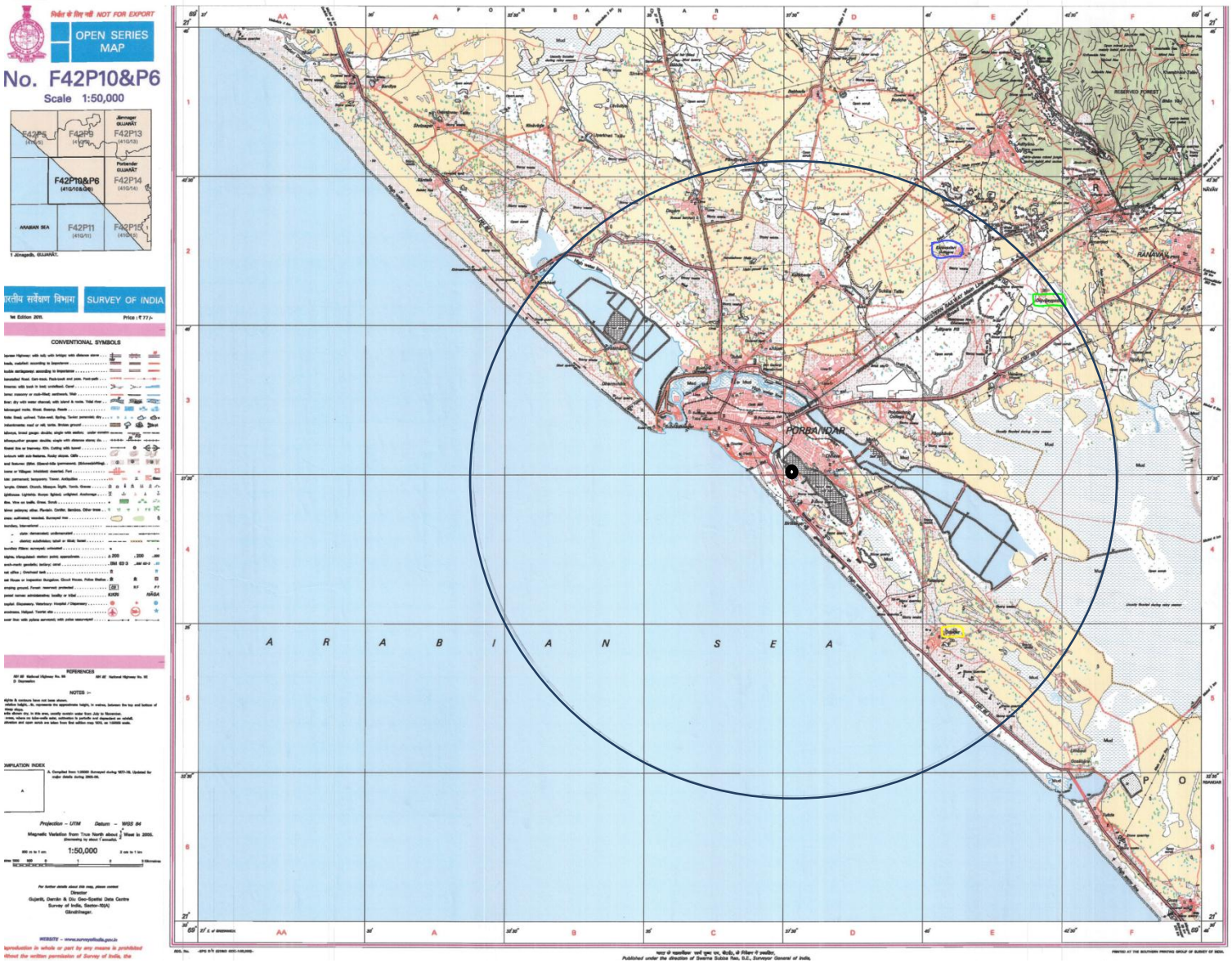
Nearest Road	NH 8E adjacent to project site
Nearest Railway station	Porbandar @ 1.41 Km, NNW
Nearest Air Port	Porbandar @ 3.33 Km in NE
Nearest Sea Port	Porbandar Port @ 3.0Km in W

(ii) Land Form& Land use.

The proposed expansion will be carried out within the premises of existing unit, therefore there will not be any change in land use pattern.

Please refer topography map of the study area attached herewith

(iii) Topography Map



(iv) Existing Infrastructure

1. Power: Existing – 20 MW captive power plant and after expansion another 20 MW will be added by installation of turbo – generator set.
2. Water: Existing water demand of water is met through sea water/Dam water. There will not be increase in consented water demand after the proposed expansion.
3. Basic amenities: Colony for employee with all basic facilities like bank, school, post office and medical facilities. The industry is well-connected road with state and national highway.

(v) Soil classification of Porbandar District

The soils of Porbandar district may be classified into three main categories:

a. Shallow to Medium black soils

b. Deep black soil (Ghed area)

c. Coastal alluvial soils

Shallow to Medium black soils are very widespread and occurs in 75 % of the area and are found almost in all the talukas. They are more productive and are rich in lime, magnesia and alumina raid poor in phosphorous, nitrogen and organic matters. They can retain considerable moisture and are much suitable for agricultural. Coastal alluvial soils are found in coastal parts of Porbandar Taluka where the soils are less productive as they are saline.

(vi) Climate data from secondary source

General climate of the district is sub-tropical and is characterised by three well-defined seasons, i.e. summer - from April to June, monsoon - from July to September, and winter - from October to March.

Temperature: Mean maximum daily temperatures range from 29 to 34°C and mean minimum daily temperatures from 14 to 27 °C. April and May are the hottest months when the temperatures may exceed 33°C. The winters are generally pleasant with minimum temperatures around 13.7°C, however, at times temperatures may drop further.

Humidity: The relative humidity is highest in the early morning, which reduces as the day advances. In the monsoon season the humidity is high reaching up to 83%, during winters it may drop down to 47%

(vii) Transport and Communication

(a) Road:

National highway 8 B and 8E (Ext.) passes through the district, connecting Porbandar with Rajkot (187 km) and Jamnagar (275 km)

Distance to major districts in Gujarat:

Ahmedabad (412 km), Surat (648 km), Vadodara (481 km), Gandhinagar (440 km), Vapi (715 km), Ankaleshwar (565 km) and Mehsana (491 km)

With an estimated cost of INR 735 Crore (USD 175 million), the Government of Gujarat has proposed a road project of over 300 km, linking the port with Rajkot. The Golden Quadrilateral Project originates from Porbandar to be ultimately connected with Silcher in Assam.

(b) Rail:

Porbandar is connected with Rajkot, Surat, Vadodara, Surendranagar, Jamnagar, Ahmedabad, Mumbai and Delhi by western railways.

Four broad gauge rail lines of total length of 33 km are present in Ranavav, Rana Bordi, Sakhpur and Tarsi.

To increase the accessibility to Porbandar port, a rail project connecting the port with Jamnagar is proposed by Indian Railways (Source: Gujarat Infrastructure Development Board, 2007), (Source: District Profile 2004, Road and Building Department, Government of Gujarat, 2007)

(c) Air

Porbandar has an airport, connecting the district to Ahmedabad and Mumbai

(d) Port

The district has a 106 km long maritime border facing the Arabian Sea with an all-weather port at Porbandar.

The port is well connected with other districts of Gujarat by means of road and rail.

At this port, commodities like coal, date palm, LPG, butane, building materials, animal feed, steel, edible oil are imported.

The exports include commodities like fish, cement, groundnut cakes, soyabean cakes, edible oil, bauxite, onion, garlic and building materials.

M/s. Saurashtra Cement Ltd. has developed private jetty at Porbandar.

M/s. IMS Petrogas is also handling gas from Porbandar port.

(viii) Social Infrastructure available

Literacy rate:

Porbandar district has 75.78% literacy rate and female literacy rate is 67.75%.

Sub-district Porbandar has the highest literacy rate of 77.93% and Ranavav has the lowest literacy rate of 71.48% among all sub districts of Porbandar.

There are 372 primary schools and 71 secondary and higher secondary schools in the district. One Government Polytechnic college in Porbandar is offering diploma courses in disciplines like electronics, mechanical and civil engineering with an intake capacity of 420 persons. The Industrial Training Institute in the district trains 272 persons annually into industrial fields such as, electronics and computers and professions such as diesel mechanic, auto parts and motor vehicle mechanics etc. (Source: Porbandar District Profile, Employment and Technical Education)

Economic Activity:

1. The economy of the district is basically dependent on agricultural activities as 49.60% workers are engaged in agricultural work.
2. 50.40 % of workers are engaged in other works.
3. Kandla port is the major port of western region so a big junction for import-export industries.
4. Non-metallic mineral products, Chemical products and food products are the other important activities workers engaged in.

Health

There are 10 primary health care centres (PHC), 3 community health care centres (CHC) and 1 civil hospital present in the district ß in addition, Porbandar has specialised hospitals to provide a comprehensive range of tertiary and secondary care. Backed by the state-of-the-art technology and trained clinicians, the orthopedics, eye treatment and child health care units are available in the district. (Source: Porbandar District Profile, 2004)

2. Planning Brief

(i) Planning Concept (type of industries, facilities transportation etc) Town and Country Planning/Development authority Classification.

Proposed expansion will be carried out within the existing premises of industry through modernization. Planning mainly involves construction and installation of new plant machinery.

(ii) Population

Porbandar district has 3 sub-district and 179 inhabited villages and 3 uninhabited villages.

Porbandar district is the second lowest district only after The Dangs in terms of population in the State. 2. In Porbandar district, Sub-district Porbandar has the highest population (384660) whereas sub-district Kutiyana has the lowest (86221)

Description	No.
Population	Total : 5, 85,449Person
	Male : 300,209 Person
	Female: : 285,240 Person
Population density	308 persons per sq. km.
Village Population	Total: 300236 Person

(iii) Land use planning (breakup along with green belt etc).

Sr. No.	Particular	Area (m^2)
1	Built Up Area*(on Ground Floor)*	199678.43
2	Green belt area	8256
3	Open/ Road area	311039.57
	Total	**518974**

(iv) Assessment of Infrastructure Demand (Physical & Social).

Surrounded villages in 10 km area from the project site are having all the necessary physical and social infrastructure facilities due to agricultural activities, animal husbandry and industrial development within the area.

(v) Amenities/Facilities.

All the basic amenities/facilities such as power connection & power back-up, drinking water, internal roads, water & wastewater treatment plant etc. are provided.

3. Proposed Infrastructure

a. Industrial Area

Industry has provided 199678.43m^2 total built up area for industrial process/manufacturing activity which provides all needed facility including proper ventilation, safe handling system, etc.

b. Residential Area

Existing industry has already developed colony for settlement of their employees and workers about 50382 m^2, no additional area required to be develop for the settlement after proposed expansion

c. Green Belt.

8, 256 m^2area will be proposed for greenbelt development. In addition to this, project proponent will participate in greenbelt development programs in nearby areas under their CSR.

d. Connectivity (Traffic and Transportation Road / Rail / Metro / Water ways

National Highway passes adjacent to project site. Nearest railway station is located at 3.5 km (ground distance) in north direction. Sea Port is located at 8.5 km (ground distance) in west direction from project site.

e. Drinking Water Management

Currently, water required for drinking purposed is taken from Khambhala Dam. But in case of scarcity of water in dam, water requirement is fulfilled by the RO plant. After the proposed expansion industry is planning to utilize water from RO plant only.

f. Sewerage System.

Same as existing practice, Industry will be disposing Domestic effluent through the Septic Tank/ Soak Pit System.

g. Industrial Wastewater Management.

Total industrial wastewater generation will be 1,69,960 KLD. 58 KLD from boiler blow down, 11955 KLD from process, 19900 KLD from Kiln Scrubber, 20400 KLD from once through cooling tower, 30,000 KLD from cooling system of Wet Section and 74025 KLD sea water for effluent dilution.

Details of Effluent Treatment Plant

Effluent generated from process is being diluted more than 10 times through fresh sea water along with once through cooling Seawater of the Soda Ash Plant to bring down the temperature as well as reduce concentration of suspended solids.

Cooling water for CPP is being reused up to 10735 KLD.

Online monitoring systems for temperature, pH and Ammonical Nitrogen have been provided at effluent line.

pH of the effluent is controlled by direct passing CO_2 gas (40%) and HCl solution in the effluent channel line.

Treated effluent travels within plant through an open constructed channel of 1.3 km, followed by 270 mtrs submerged pipeline. This 270 mtrs pipeline (2 Nos. x 900 mm dia) with a diffuser system for proper dispersion is laid submerged in the Arabian Sea.

h. Solid/Hazardous Waste Management

Same as existing practices discarded bags and containers will be sold to approve vendor. Used oil is reused as a lubricant within the factory premises/sold to registered recycler.

i. Power Requirement & Supply / source

Power requirement for the existing and proposed expansion project will be met though existing Co-generation power plant. (Existing 20 MW and Proposed 20 MW).

4. Rehabilitation and Resettlement (R & R) Plan

Since no additional land will be acquired for the proposed expansion project, and all necessary modification will be carried out existing plant premises, there will not be any requirement of R&R plan.

5. Project Schedule & Cost Estimates

(i) Likely date of start of construction and likely date of completion (Time schedule for the project to be given)

For the proposed expansion / modernization project construction work carried out only for installation of plant machinery. No major construction work will be required to be carried out for this project and it will be started after obtaining Environmental Clearance only.

Project Cost Estimation:

Sr. No.	Particular	Existing plant cost (INR in Lac)	Proposed Cost	Total after expansion (INR in Lac)
1	Building	76001	15000	91001
2	Plant & Machineries			
3	Environment Protection Measures	415	150	565
Total		**76416**	**15150**	**91566**

(ii) Estimated project cost along with analysis in terms of economic viability of the project.

The proposed expansion involves replacement of old machineries having comparatively low efficiency with latest machineries and technology. Major advantages of this modernization/replacement will result in increased production capacity without any major increase in raw material consumption, fuel consumption, water consumption as well as wastewater generation. This will intern increases the total efficiency of plant and leads to profit creation.
