



**AHIR SALT & ALLIED PRODUCTS  
PVT. LTD.**

**Draft Report on: EIA/ EMP and RA/  
DMP Report for Installation of Isolated  
Liquid Storage Terminal at Survey No.  
573, Village Mithirohar, Taluka  
Gandhidham, District Kutch**

**NOVEMBER 2012**



**Kadam**

Environmental Consultants  
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Environment *for* Development

## EXECUTIVE SUMMARY

### Introduction and Background

Ahir Salt & Allied Products Private Limited (ASAP) is a part of Neelkanth group of companies. Neelkanth Group is engaged in diversified business of salt, shipping, construction, logistic and international trading of chemicals, foodstuff. This group is established in 1962 by promoters Mr. Arjan S. Kangad, Mr. Teja S. Kangad and Mr. Samji S. Kangad. This group includes the following establishments;

- Neelkanth Salt Supply Co.
- Neelkanth Enterprise
- Patel Construction Co.
- Jai Jogni Salt Industries
- Shree Ram Enterprise
- Air Salt & Allied Product Pvt. Ltd.
- SRK Chemicals Ltd.
- Neelkanth Infrastructure Ltd.
- Raj Corporation
- Neelkanth Handling Agency

Ahir Salt is member of Indian Salt Manufacturing Association (ISMA).

Ahir Salt & Allied Products Private Limited (ASAP) was established in 1990. The Company's headquarterd registered at Gandhidham and proposes setting up an isolated storage facility at the Kandla port, Kutch District, Gujarat.

### Project Background

M/s Ahir Salt & Allied Products Private Limited owns saltpans over an area of 1357.56 acres, out of which Government of Gujarat (GOG) has allocated an area of 40 acres for the purpose of liquid and dry Storage Terminal. The total number of tanks to be installed are 85, and the maximum total capacity will be 2,42,182 KL. The landward distance of the proposed storage terminal is approximate 1.2 km from the Kandla Port Jetty.

The proposed liquid storage terminal will receive the liquid chemicals from oil jetty through the KPT (Kandla Port Trust) laid pipelines by tapping and will transfer these chemicals to end users by Road Tankers. The project envisages:

1. Receipt, storage and dispatch of third party materials (both from terminal to jetty or jetty to terminal) *as transit storage facility ; and/or*
2. Purchase, storage and sale of materials *as a trading activity*

### Regulatory Framework

ASAP plans to establish new isolated storage facility at Village Mithirohar and therefore has initiated the EC process with the SEIAA. It will therefore fall in 'Category B' of the Environmental Impact Assessment Notification, i.e. Schedule 6 (b) requiring Environmental Clearance from SEIAA, Gandhinagar.

## Project Description

The site is located at Village Mithirohar, Old Kandla Port in Kutch District.

## Location of the Project

The site is located at an arial distance of ~ 1.33 km SSE of Kandla Port Colony. The total land area under lease is 1357.56 acres in the name of ASAP used as a saltpan, out of this, 40 acres (161881 m<sup>2</sup>) will be converted for the use of liquid storage facility and rest areas will be continued to be used as saltpan.

## Storage Capacity of the Terminal

Storage capacity details provided at the terminal are given as below;

S. No.	Name of Product	Name of the Proposed Chemicals	Capacity of Storage Tank (KL)	Total No. of Tanks	Maximum Capacity (KL)
1.	Storage of Class "A" Liquid	Acetone, Benzene, EDC, Ethyl alcohol, Hexane, IPA, Butanol, Methanol, Solvent Naphtha, Toluene and other Class A chemicals	866-4069	36	86,779
2.	Storage of Class "B" Liquid	N-Butanol, Cyclohexanone, Nonene, Kerosene, Para Xylene and other Class B chemicals	866-4069	38	1,20,468
3.	Storage of Class "C" Liquid	Cyclohexanol, LDO, FO other Class C chemicals and other liquid materials such as edible oils	1357-3419	11	34,935
<b>Total Capacity</b>				<b>85</b>	<b>2, 42, 182</b>

## Power Requirement

The total power requirement during constructional phase will be 30 kW and during operational phase shall be around 347 kW. The power will be sourced from PGVNL (Paschim Gujarat Vij Nigam Limited). D. G. Set of 150 kVA capacity will be required as a stand by source of electricity.

## Water Requirement and Wastewater Generation

Peak water consumption for the proposed terminal will be 39.1 KLD & wastewater generation will be 5.9 KLD, during winter season only. It will be sourced from the Gujarat Water Infrastructure Limited (GWIL). During the remaining part of the year daily water consumption will be 14.8 KLD & wastewater generation will be 4.6 KLD. Break up of water consumption and wastewater generation along with disposal mode in given as following;

S. No.	Description	Quantity in KLD				Disposal Mode
		Water Consumption		Wastewater Generation		
		Peak	Average	Peak	Average	
1	Domestic	2.5	2.5	2.1	2.1	Discharged to soak pit
2	Boiler	25.6	-	1.3	-	Treated in Oil/ Water Separators and used for on land irrigation
3	Washing / Spraying (Floor and Tank	2.5	2.5	2.5	2.5	

S. No.	Description	Quantity in KLD				Disposal Mode
		Water Consumption		Wastewater Generation		
		Peak	Average	Peak	Average	
	Cleaning)					
4	Gardening	8.5	9.8	-	-	During peak water consumption (8.5 KLD Fresh water + 5.9 KLD treated effluent) During average water consumption (9.8 KLD Fresh water + 4.6 KLD treated effluent)
	<b>Total</b>	<b>39.1</b>	<b>14.8</b>	<b>5.9</b>	<b>4.6</b>	After removal of oil, water will be used in on land irrigation

### Air Emission

Details of Flue Gas Stacks are given below;

S. NO.	Stack Attached To Source	Type of Fuel	Fuel Consumption	Stack Height, m	Stack Top Diameter, m	Stack Height as per GPCB Norms	Remarks
1	Oil Fired Boiler (Horizontal Smoke Tube) 3.0 Ton/Hr	FO/ LDO	8 kg/ hr	15	0.4	1	Adequate Stack height
2	D. G. Set (150 kVA)	HSD	2 lit/ hr	9	0.2	9	Adequate Stack height

### Solid and Hazardous Waste Management

Details of the solid and hazardous disposal system are mentioned as following;

S. No.	Hazardous Waste	Category	Generation Quantity	Disposal Method
1	Used Oil	5.1	20 Liters/Month	Collection, Storage, Transportation, Disposal through Authorized Refiner
2	Oil Waste	3.3	75 Liters/Month	Collection, Storage, Transportation, Disposal through Incineration at CHWIF
3	ETP Sludge	34.3	1.5 Kg/Month	Collection, Storage, Transportation, Disposal at TSDF
4	Pigging Waste	Class – E2; Schedule III	100 Kg/Month	Collection, Storage, Transportation, Incineration at TSDF

### Description of the Environment

Baseline environmental studies were carried out during Summer Season of year 2012.

### Study Period

The study period is Summer Season (Mid April – June) of 2012.

### Study Area

The study area is defined as area within 10.0 km radius from the proposed project.

### Landuse of the Study Area

A recent satellite image for the study area was collected using Google Earth Pro. The image was interpreted for identification of various land usage along the study area and was actually verified at site through ground truth survey. Land use of study area is broadly classified into categories such as Habitation, Industrial Area, Agriculture Land, Land with Shrubs, Land without Shrubs, Water Bodies, Mud Flat Area, Sandy Area, Mangroves, River Area, Sea and Salt Pan. The major portion of land is covered by Mud Flat Area use (39.85%), Salt Pan (17.67%) and Sea (12.33%).

### Climatology

- Site-specific meteorological data shows that average wind speed during the study period is 4.9 m/s and mostly noon hours are windier with maximum wind speed of 7.4 m/s.
- It can be observed that wind blows mostly from South West direction. Calm wind contributes to about 3.02%.
- Average temperature recorded for study period was 32.5 °C with maximum temperature of 38 °C and minimum of 27.5 °C, which is a characteristic of this study area.
- The average humidity recorded was 56% with maximum humidity of 74.8% and minimum of 38.8%.

### Ambient Air

The ambient air monitoring work was carried out spread during summer season of the year 2012. A comparison of the results with the value range indicators provided by CPCB indicates the following:

AAQM Station	Location Description	Distance in Km from Centre of Project Site	Direction	Average Result in $\mu\text{g}/\text{m}^3$ , except VOCs in $\text{mg}/\text{m}^3$						
				PM <sub>10</sub> (100)	PM <sub>2.5</sub> (60)	SO <sub>2</sub> (80)	NO <sub>x</sub> (80)	THC (NS)	CO (2000)	VOC (NS)
A 1	At Proposed Site	-	-	65	19	8.2	10.9	1008	<1145	<0.25
A 2	Near Pump House	1.80	NW	58	20	8.2	10.9	994	<1145	<0.25
A 3	Near Salt Pan Office	0.52	NNW (Up wind)	55	20	8.1	10.7	1011	<1145	<0.25
A 4	Near Mosque	0.83	NE (Down wind)	68	24	8.1	11.2	1014	<1145	<0.25

AAQM Station	Location Description	Distance in Km from Centre of Project Site	Direction	Average Result in $\mu\text{g}/\text{m}^3$ , except VOCs in $\text{mg}/\text{m}^3$						
				PM <sub>10</sub> (100)	PM <sub>2.5</sub> (60)	SO <sub>2</sub> (80)	NO <sub>x</sub> (80)	THC (NS)	CO (2000)	VOC (NS)
A 5	Kandla Port Colony	1.55	SSE (Cross wind)	77	28	8.6	11.6	1057	<1145	<0.25

### Noise

Noise levels were recorded at four different locations within the study area. The Ambient Noise Level is as per CPCB Guidelines. Activities of proposed installation will not increase the prevailing noise level. However, locally the installed machinery's noise level should be studied after installation of the plant machineries.

Station Code	Noise Monitoring Location	Date of Monitoring	Category of Area/ Zone	CPCB Limits in dB (A)		Average Noise levels in dB (A)		Remark
				Day	Night	Leq (Day)	Leq (Night)	
NL 1	At Proposed Site	27/06/2012	Industrial	75	70	72.6	63.5	-
NL 2	Near Port Colony	28/06/2012	Residential	55	45	54.3	48.8	Noise level during night time is high due to transportation. This area is near to the KPT.
NL 3	Near Salt Pan Office	28/06/2012	Industrial	75	70	53.5	45.1	-
NL 4	Near Mosque	28/06/2012	Industrial	75	70	56.4	45.8	-

Source: Analysis carried out by KEC

### Ground water Quality

Ground Water samples were collected from different locations within the study area as following and analyzed for parameter mentioned in IS 10500.

Code	Location	Source	Distance in Km from Centre of Project Site	Direction	Date of Sampling	Parameter exceed from Permissible Level
GW 1	Near Site	Tubewell	-	-	01/06/2012	Electric Conductivity, Chloride, Sulphate, Total Hardness, Calcium, Magnesium and Iron

Code	Location	Source	Distance in Km from Centre of Project Site	Direction	Date of Sampling	Parameter exceed from Permissible Level
GW 2	Salt Pan Office near ASAP	Borewell	0.53	NW	19/05/2012	Electric Conductivity, Chloride, Sulphate, Total Hardness Calcium, Magnesium
GW 3	Pump House near ASAP	Borewell	1.62	NNW	19/05/2012	Electric Conductivity, Chloride, Sulphate, Total Hardness Calcium, Magnesium
GW 4	Near Mosque	Tubewell	1.19	NE	01/06/2012	Electric Conductivity, Chloride, Sulphate, Total Hardness, Fluoride, Calcium, Magnesium and Iron
GW 5	IFFCO site	Tubewell	0.27	E	01/06/2012	Electric Conductivity, Chloride, Sulphate, Total Hardness, Fluoride, Calcium, Magnesium and Iron

### Surface Water Quality

Surface Water samples were collected from different locations within the study area and analyzed for parameter mentioned by CPCB for Coastal Water Marine.

Code	Location	Date of Sampling	Distance in Km from Centre of Project Site	Direction	Class of Marine Water body as per CPCB Guideline
SW 1	Creek Near Mosque	01/06/2012	1.89	NE	SW- I (Salt)
SW 2	Near Port colony-Creek	01/06/2012	1.26	SE	SW- I (Salt)

### Soil

Soil samples were collected from five locations within the study area as given following:

Code	Location	Distance in Km from Centre of Project Site	Direction	Date of Sampling	Remark
S 1	At Proposed Site	0.0	-	1/06/12	Soil (S 2- Near Salt Pan Office) contains high amount of salt and it is dissolve in water, so that parameter like water holding, permeability, particle size, cation exchange capacity and texture is not done
S 2	Salt Pan Office	0.73	NW	19/05/12	
S 3	Near Pump House	1.79	NW	19/05/12	
S 4	Near Mosque	1.64	NE	01/06/12	
S 5	Near Port Road Crossing	1.80	SW	01/06/12	

## **Traffic Survey**

Based on site observation, increase in traffic due to proposed installation will be 10% at adjacent road. And due to proposed installation increase in traffic near Zero Point Road will be negligible. PCU<sup>1</sup> carrying capacity is 900 PCU for 2- Lane one way. Due to proposed installation traffic load will be increased by 10 %. It is well within the limit of 900 PCU for 2- Lane one way.

## **Biological Environment**

The list of floral species is prepared based on visual observation during site visit and through review of site literatures and secondary data available with various government offices is referred for identifying rare or endangered species in the region.

A total of 34 plant species are observed in the study area out of which 22 species of trees and shrubs, 4 species of Climbers, 6 species of grasses and 2 species of mangroves are observed.

Total 3 mammal's species, 3 Reptiles species, 59 species of avifauna were reported in the study area. Common Peafowl (Schedule I) bird species present in the study area. Total fish production of the year 2010-11 of Kandla is 3611856.

## **Anticipated Environmental Impact Identification, Prediction and Mitigation**

### **Ambient Air**

#### ***Impact Identification***

During the construction phase of the project, the major activities will involve earth work excavation, transport of construction materials, building of structures etc. These activities would cause a general increase in levels of dust and suspended particulate matter in the ambient air.

Impacts on ambient air during operation phase would be due to emissions from stack of boiler and operation of DG sets of 150 kVA.

The maximum 24 hourly average GLC's are predicted to be 2.5 µg/ m<sup>3</sup>, 2 µg/ m<sup>3</sup> and 0.1 µg/ m<sup>3</sup> for SO<sub>2</sub>, NO<sub>x</sub> and Particulate matter respectively. These GLC's are expected to occur at a distance of 100 m from the source towards the NE direction.

#### ***Mitigation Measures***

- Periodic checking of vehicles and construction machinery to ensure compliance to emission standards
- Protection of receptor through greenbelt/ green cover
- Regular monitoring of air pollution concentrations, etc

### **Noise**

#### ***Impact Identification***

The proposed project will lead to emission of noise that may have significant impact on the surrounding communities in terms of increase in noise levels and associated disturbances.

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<sup>1</sup> As per The Indian Road Congress- Guideline for capacity of roads in urban Areas (IRC: 106-1990), Table-2, Recommended Design Service Volumes, page-11



Following activities would result in increase in noise level;

- Noise from operation of pumps, blower and boiler
- Noise from vehicular movement
- Noise from DG Set

#### ***Mitigation Measures***

- Use of suitable muffler systems/ acoustic enclosures/ pumps/ blowers
- Pumps and blowers may be mounted on rubber pads or any other noise absorbing materials
- Limiting certain activities
- Placement of equipments emitting high noise in an orientation that directs the noise away from sensitive receptors
- Periodic maintenance of equipments/ replacing whenever necessary/ lubrication of rotating parts, etc
- Use of ear protective devices
- Implementation of greenbelt for noise attenuation may be taken up, etc.

### **Water**

#### ***Impact Identification***

Total fresh water consumption for the proposed terminal will be 41.6 KLD. And water will be sourced from the Gujarat Water Infrastructure Limited (GWIL).

Peak Effluent generation quantity will be 5.9 KLD & average effluent generation quantity will be 4.6 KLD. It will be passed from oil/ water separator and the treated wastewater will be use for on land irrigation hence there is no adverse impact on receiving water body. Domestic effluent generation quantity will be 2.5 KLD, which will dispose to the soak pit.

There will be no disposal of untreated water on land so impact on groundwater quality due to proposed activity is not anticipated.

#### ***Mitigation measures***

- Effluent generated will be given treatment in the ETP and then used for on land irrigation.
- The storage and handling areas including effluent treatment areas will be made impervious to prevent leachate migration.
- There will be no disposal of untreated water on land.
- Monitoring of ground waters
- Prohibit discharge of contaminated water onto the land or water body.
- Oil wastes may be collected through water and oil separator or skimmer.

### **Soil**

#### ***Impact Identification***

Soil quality may be affected by storage, leakage and spillage of chemicals. Improper storage of hazardous waste at the hazardous storage area can also result in contamination of the soil.

#### ***Mitigation Measures***

- Windscreens, maintenance, and installation of ground cover

- Installation of drainage ditches
- Minimize disturbances and scarification of the surface
- Usage of appropriate monitoring and control facilities for construction equipments deployed
- Methods to reuse earth material generated during excavation
- Proper handling of excavated soil
- Proper plan to collect and dispose off the solid waste
- Prohibit burning of refuse onsite, etc.

## **Biological**

### ***Impact Identification***

Construction caused minor disturbance to near by water birds habitat due to noise and vibration. During transportation of Chemical from jetty to pipe line there are chances to leak chemical offshore may cause the damage to marine environment i.e. Phytoplankton, Zooplankton, Benthos and Fishes.

Leakage of chemical onshore during transportation or due to leakage of pipeline may cause damage to small reptiles and terrestrial flora and fauna of the surrounding area

### ***Mitigation Measures***

- The area used for proposed liquid storage is a saltpan so there is no clearance of vegetation required.
- Greenbelt plantation will be done after construction.
- There is no ecological important area (e.g. National Park, Sanctuary) in the study area so impact on that area will be ruled out.
- All the transportation trucks shall be leak proof and the driver of goods carriage at onshore and offshore is trained in handling the dangers posed during transport of such goods and is aware of safety rules for transportation of hazardous materials so that the chances of tanker over turning and leakage at jetties are very less.
- Installation of systems to discourage nesting or perching of birds in dangerous environments
- Increased employee awareness to sensitive area, etc.

## **Socio-Economic**

### ***Impact Identification***

The habitation and households are not very near to the proposed site. The villages fall in the 7-10 km. range from the proposed site and hence there will not be much impact to the people. The mining, installation and construction of the storage terminals will surely generate employment opportunities, both direct and indirect, for the local people. A number of skilled and unskilled workers can be employed which generate direct or indirect employment and improves the standard of living of the project affected people. Additional facilities such as medical, educational, and infrastructural development will also take place. The frequency of transportation will also increase which will directly affect the living conditions of the people in the study area.

### ***Mitigation Measures***

- The project proponent will seek to provide better educational facilities in the project affected area and shall equip the schools with furniture and technological aids and that help in providing better education.
- The project proponent will provide employment to the local people.

During construction phase, about ~ 50- 100 job opportunities for a few months and ~30 job opportunities during operational phase are envisaged. Further, jobs will be created indirectly. Thus a significant benefit to the socio-economic environment is likely to be created.

## **Additional Studies**

### **Demographic and Socio- Economic Profile**

Analysis of the demographical statistics, based on Primary Census Abstract, 2001& field survey reveals that the study area has a total population of 58285 in the study area.

Average scheduled castes constitute about 8.7 % of the total population of villages in the study area. Scheduled tribes constitute about 7.2% of the total population of villages in the study area. Villages in the study area have fairly good infrastructure facilities.

### ***Hazard Identification and Consequence Assessment***

Hazards are identified for release of Acetone, Benzene, Ethylene Di-chloride, Ethyl Alcohol, Hexane, Butanol, Methanol, Toluene, P-xylene, Cyclohexanone, Nonene, FO and Acetone for scenarios considered like 2 mm, 10 mm & Catastrophic rupture of storage tank at proposed site. Consequence analysis of all possible containment scenarios was carried out using DNV Technica Software (PHAST).

### **Disaster Management Plan**

The development of a DMP is to ensure effective control of an emergency to minimize loss to human life and property. First objective of a DMP is to save human life and then comes minimizing damage to property. The DMP describes the role and responsibilities of various authorities under the emergency organization. Specifically, the DMP contains the following:

- Information about the MCLS and their effect zone;
- Checks and inspections to prevent incidents leading to emergencies;
- Prevention plan of an impending emergency by control of incidents;
- Internal emergency reporting and communication system;
- Offsite plan components;
- Regulatory requirements

It is recommended that the DMP integrated into the actual operations prior to commencement of project work. Mock drills should be conducted at periodic intervals to check the efficacy of the DMP.

### **Project Benefits**

The project benefits are summarized as follows:

- Plant will be set up on State Government's land; hence no displacement of people is required.
- Substantial Socio-economic benefits
- Around the project site semi-skilled and unskilled workmen are expected to be available from local population in these areas to meet the manpower requirement during construction and Operational phase.
- There will be employment opportunity for local people during construction and operation phase.
- Infrastructural facilities will be improved due to the project.

- No displacement of people will be required.

### **Environmental Management Plan (EMP)**

The EMP provides a delivery mechanism to address potential adverse impacts, to instruct employee and to introduce standards of good practice to be adopted for all project works. For each stage of the programme, the EMP lists all the requirements to ensure effective mitigation of every potential biophysical and socio-economic impact identified in the EIA. The EMP covers the following:

- Responsibility of ASAP;
- A comprehensive listing of the mitigation measures (actions) that ASAP shall implement;
- The parameters that shall be monitored to ensure effective implementation of the action;
- The timing for implementation of the action to ensure that the objectives of mitigation are fully met.

### ***Expenditure on Environmental Matters***

The total cost of the project approximately INR 9894.26 Lacs. Approximate capital cost on environmental issue will be INR 50.1 Lac and recurring cost INR 6.39 Lac/ Annum.

### ***Environmental Mitigation***

The project will be designed to avoid or minimize impacts to the environment and local communities wherever practicable & desirable. Where residual impacts remain, which may have moderate or significant effects on the environment. Some major mitigation measures are:

- Operation of Effluent Treatment Plant to treat waste water generated;
- Disposal of hazardous waste and solid waste to the authorized TSDF site;
- Acoustic insulation of pumps, blowers, DG Set and other machineries;
- Controlling air emission from boiler and DG set to limiting values as per NAAQS, 2009

### ***Environmental Monitoring***

The following will be monitored on a regular basis during construction and also during operation phase to ensure a high level of environmental performance being maintained:

- Waste water generated from the plant will be treated and used for on land irrigation;
- The general effectiveness of pollution control measures shall also be monitored;
- Post project sampling and effect on baseline data generated during preparation of EIA report

### **Major Recommendations**

In depth recommendations covering the following have been made using professional judgment, and national standards;

- General safety practices
- Material handling
- Process and equipment safety
- Personnel Safety
- Maintenance of equipment including emergency/ firefighting equipment

- The emergency management includes emergency prevention, emergency response plan (on site and off site), Chemical spill contingency plan and inspection of fire fighting equipment and systems

### **Conclusions**

It can be concluded on a positive note that after the implementation of the mitigation measures and environmental management plans, the project activities during the construction and operation phase would have manageable and on balance, the project would be beneficial to surrounding communities and the region. Further, the management of the isolated storage terminal facility will be done in accordance with rules and regulations as stipulated in the relevant statutes, codes and orders.