

## **ANNEXURES**

### **ANNEXURE I**

#### **ENVIRONMENTAL SCREENING FORM**

PART A (to be prepared by Urban Local Body for each sub – project loan)

Name of the applying urban local body : Nagercoil Municipality in  
Kanyakumari District

Project location : Nagercoil Municipality

Sub project : Water Supply Improvement Scheme to  
Nagercoil Municipality

Project Components		
S.No	Component	Remarks
1	Brief description of the project proposal	Supplying 52.04 mld (Ultimate) of drinking water to Nagercoil municipality with source Paraliar River at U/s of Puthendam
2	Number of project sites and Project components	Details provided in Annexure -3
3	Alignment length	27 km
4	Location of the Project Sites & Current Use	Details provided in Annexure -3
5	Nearby land uses and distance – residences, schools, hospitals, drinking water source, upstream and downstream uses of rivers etc	Offtake and sump WTP are in alignment away from developments. WTP and OHTs are in the midst of developments.
Proximity of the Site to Water Bodies		
S.No	Component	Remarks
6	Distance of sites from Sea	20 km
7	MSL of Project Sites	71m at Head works and 40 m at WTP at Krishnancoil
8	Distance from nearest Water Body (River, Canal, Lake, Streams etc.,)	10 m. Head works in bank of River Paraliar
9	MFL of the Project Sites	76.5m at Head works
10	Distance of nearest drinking water source	10 m .Head works in River Paraliar.

Climate Change related Parameters (General)				
S.No	Component	Remarks		
11	Mean Temperature in the project town	Maximum and minimum temperature is 38° C and 21°C.		
12	Annual Rainfall in the project town	1450 mm		
13	Monsoon Period in the project town	South West and North East		
14	Nearest Weather Warning System	Pechiparai		
Biological Environment				
Sl. No	Components	Yes	No	Remarks / Identified Problems
15	Are there according to background research / observations any threatened / endemic species in the project area that could be affected by the project?		No	
16	Will the project directly <sup>1</sup> or indirectly affect: 1.1 Natural forest types? 1.2 Mangroves / wetlands / Estuaries 1.3 Other SEC's as Listed in ESMF		No	
17	Will the project involve tree cutting?		No	
18	Will there be any potential risk of habitat fragmentation due to the clearing activities? (eg. Hindrance to the local bio diversity like disturbing the migratory path of animals/ birds etc.)		No	

Physical Environment				
Sl.no	Components	Yes	No	Remarks / Identified Problems
19	Water quantity? Estimated usage of water quantity for the project			52.04 mld for drinking water supply
20	Will the project affects the River flow pattern, stream pattern or any other irrigation canal?		No	
21	Is the project area is free from flood prone area/ low-lying area, if yes what is the average flood level recorded for recent years?	Yes		MFL for headworks 76.5m. However components designed for 77m.
Geology / Soils				
Sl.no	Components	Yes	No	Remarks / Identified Problems
22	Does the project activity involve cutting and filling/ blasting etc...?	Yes		
23	Will the project cause physical changes in the project area (e.g., changes to the topography) due to excavation, earthwork etc...?		No	
24	Will local resources, such as rocks, sand, gravel, or groundwater be used? Estimated quantity of materials required?		No	
Pollution				
Sl.no	Components	Yes	No	Remarks / Identified Problems
25	Will the project use or store dangerous substances (e.g., large quantities of hazardous materials like Diesel, Petroleum products etc...)?	Yes		Chlorine. Permission will be obtained and necessary safety precautions would be provided.

26	Will the project produce solid or liquid wastes?	Yes		Sludge will be dried and disposed in landfill. Filter back wash water will be recirculated into the treatment system.
27	Will the project cause air pollution?		No	
28	Will the project generate noise?	Yes		
29	Will the project generate water pollution (water bodies/groundwater)?		No	
30	Will the project cause construction Hazard to workers/ residents		No	
Climate Change Adaptation and Mitigation Measures				
Sl.no	Components	Yes	No	Remarks / Identified Problems
31	Energy Consumption during operation phase			3000.5 kw
32	Is the project design included use of energy saving machineries, equipments for the sub-project,	Yes		
33	Is the project design included energy saving measures in the distribution/collection systems	Yes		Energy efficient motors have been adopted.
34	Is the project considering energy recovery options?			
35	Is the project considering waste minimization or waste reuse/recycle options?	Yes		Filter back wash water will be recirculated into the treatment system.
36	Is the project structures are designed considering the maximum flood levels of the project site.	Yes.		Headworks designed for above MFL.
37	Is the project design has considered RWH structures.	Yes		RWH proposed in SR sites.
38	Is the Project Design has considered extreme events drought, flood natural disasters.	Yes		Design has been made considering all extreme events.

- Any other features of the projects that could influence ambient environment :- Nil.
- Has any environmental assessment ( EA ) been carried out ( if yes please the EA Documents along with the form ) :-

  
Executive Engineer  
(TWAD) Project Division, Nagercoil.

  
Commissioner  
Nagercoil Municipality.

Signature and name of the officer responsible.

Date :-

Note :-

1. Environmental Screening sheet must be completed by all Urban Local Bodies/ Government Departments applying for a loan from Tamil Nadu Urban Development Fund ( TNUDF ).
2. Provide maps with the geographical location of the project and an appropriately - Scaled map.

## ANNEXURE II

### SOCIAL SCREENING FORM

PART A (to be prepared by Urban Local Body for each sub – project loan)

Name of the applying urban local body : Nagercoil municipality in  
Kanyakumari District

Project location : Nagercoil municipality

Sub project : Water Supply Improvement Scheme to  
Nagercoil municipality

Geographical areas covered by Sub-Project : Kanyakumari District

Implementing Agency : TWAD BOARD

Name and address of Officer responsible:

Land Use, Resettlement, and/or Land Acquisition				
Sl.no	Components	Yes	No	If Yes provide details
1	Does the sub-project involves acquisition of private land?		No	
2	Alienation of any type of Government land including that owned by Urban Local Body?	Yes		3.56acres. Details are provided in the Annexure 3.
3	Clearance of encroachment from Government/ Urban Local body Land?		No	
4	Clearance of squatting from Government/ Urban Local Body Land?		No	
5	Number of structures, both authorized and/or unauthorized to be acquired/ cleared/			
6	Number of household to be displaced?		No	
7	Details of village common properties to be alienated Pasture Land (acres) Cremation/ burial ground and others specify?	No		
8	Describe existing land uses on and around the project area (e.g., community facilities, agriculture, tourism, private property)?			The land use varies from site to site.
9	Will the project result in construction workers or other people moving into or			The construction workers are basically migrant

	having access to the area (for a long time period and in large numbers compared to permanent residents)?			workers involving different type of skill required for each of the stage of the project.
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10	Are financial compensation measures expected to be needed?	Yes		Compensation for the private land will be paid by the local body.
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**Loss of Crops, Fruit Trees, Household Infrastructure and livelihood**

Sl.no	Components	Yes	No	If Yes provide details
11	Will the project result in the permanent or temporary loss of			
11.1	Crops?		No	
11.2	Fruit trees / coconut palms? Specify with numbers		No	
11.4	Loss of Agriculture Land? Specify with numbers		No	
11.5	Petty Shops		No	
11.6	Vegetable/Fish/Meat vending		No	
11.7	Cycle repair shop		No	
11.8	Garage		No	
11.9	Tea stalls		No	
11.10	Loss of Grazing	Yes		Compensatory land was provided.
11.11	Loss of access to forest produce (NTFP)		No	
11.12	Any others - specify		No	

**Welfare, Employment, and Gender**

Sl.no	Components	Yes	No	If Yes provide details
12	Is the project likely to provide local employment opportunities, including employment opportunities for women?			
13	Is the project being planned with sufficient attention to local poverty alleviation objectives?			
14	Is the project being designed with sufficient local participation (including the participation of women) in the planning, design, and implementation process?			

Historical, Archaeological, or Cultural Heritage Sites				
Sl.no	Components	Yes	No	If Yes provide details
Based on available sources, consultation with local authorities, local knowledge and/or observations, could the project alter:				
15	Historical heritage site(s) or require excavation near the same?		No	
16	Archaeological heritage site(s) or require excavation near the same?		No	
17	Cultural heritage site(s) or require excavation near the same?		No	
18	Graves or sacred locations or require excavations near the same ?		No	

  
 Executive Engineer  
 (TWAD) Project Division, Nagercoil.

  
 Commissioner  
 Nagercoil Municipality.

Signature and name of the officer responsible.

Date :-

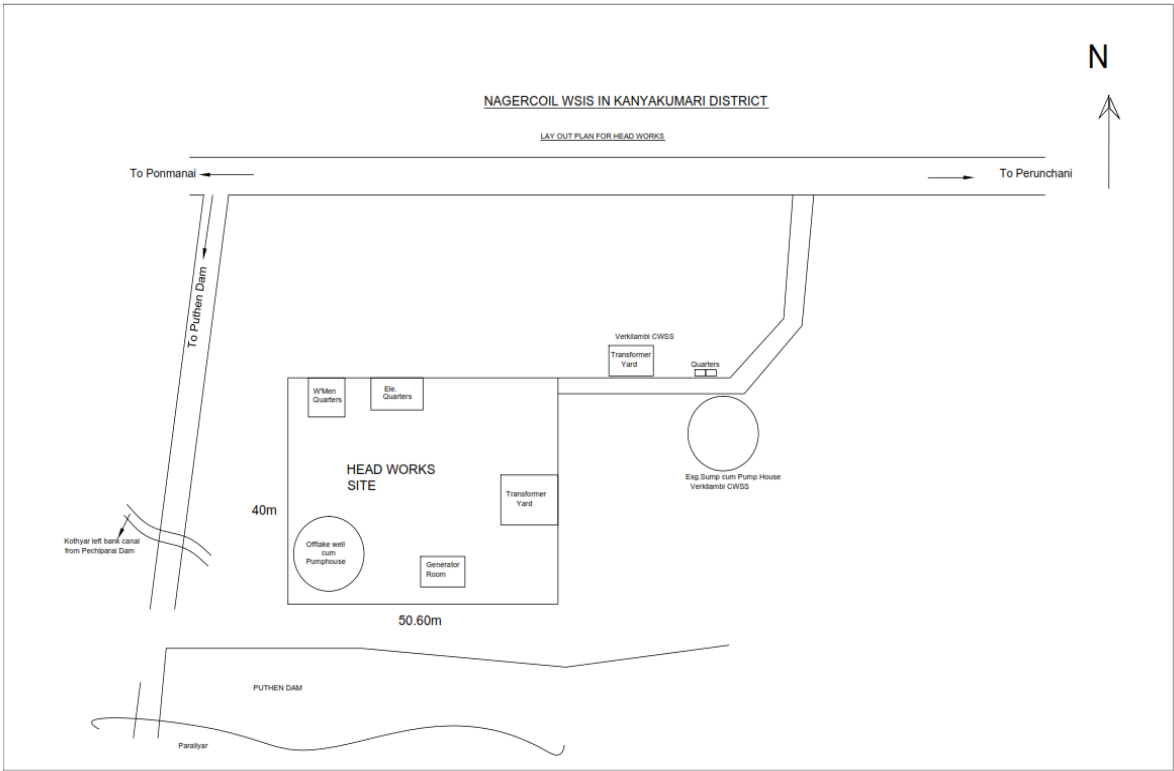
Note :-

1. Social screening sheet must be completed by all Urban local bodies / Government Department applying for a loan from Tamil Nadu Urban Development Fund ( TNUDF ) for any sub - Projects involving land alienation of any Government land under different tenure including " Poramboke " land " Owned " by the Urban Local Body or any other Government institution/Department/Organization which are alienated in favour of Project activity, when encroachments/encroachers are cleared and when community assets such as places of worship, burial/cremation grounds etc., are requested to be cleared from the execution of project activity.
2. The land details for the project components shall be annexed with details such as location, survey numbers, extent available and required, land use classification, current land use, land ownership alienation/acquisition status along with FMB extracts while submitting the Social Screening Form.

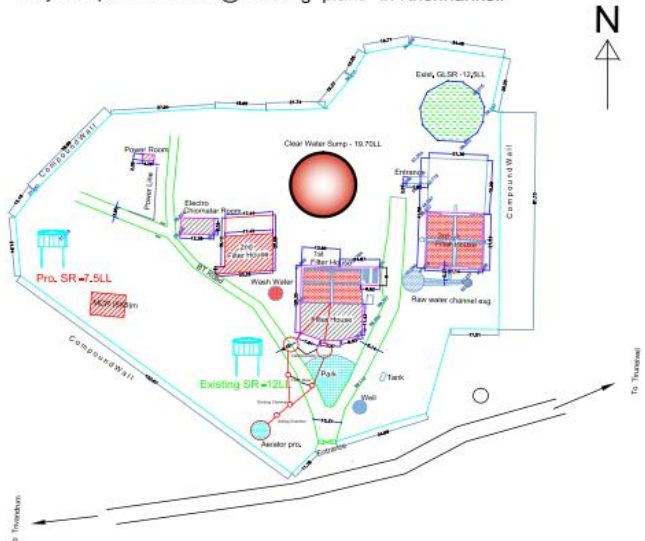


# ANNEXURE III

## LAY OUT PLAN FOR PROJECT SITES



Lay out plan for WTP @ Existing plant in Krishnankoil

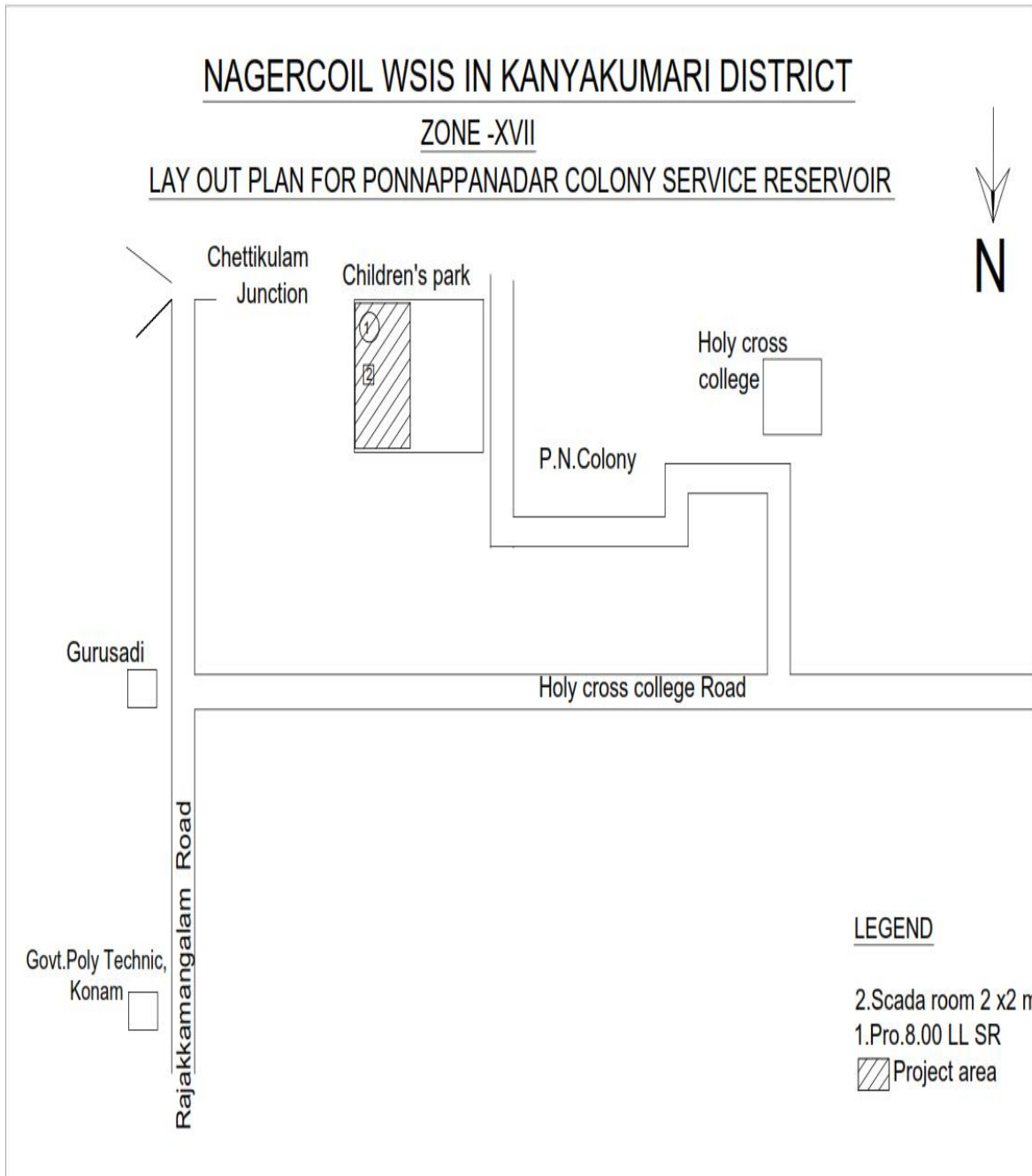


**Layout plan for WTP @ Existing Plant in Krishnankoil**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

## ZONE -XVII

### LAY OUT PLAN FOR PONNAPPANADAR COLONY SERVICE RESERVOIR

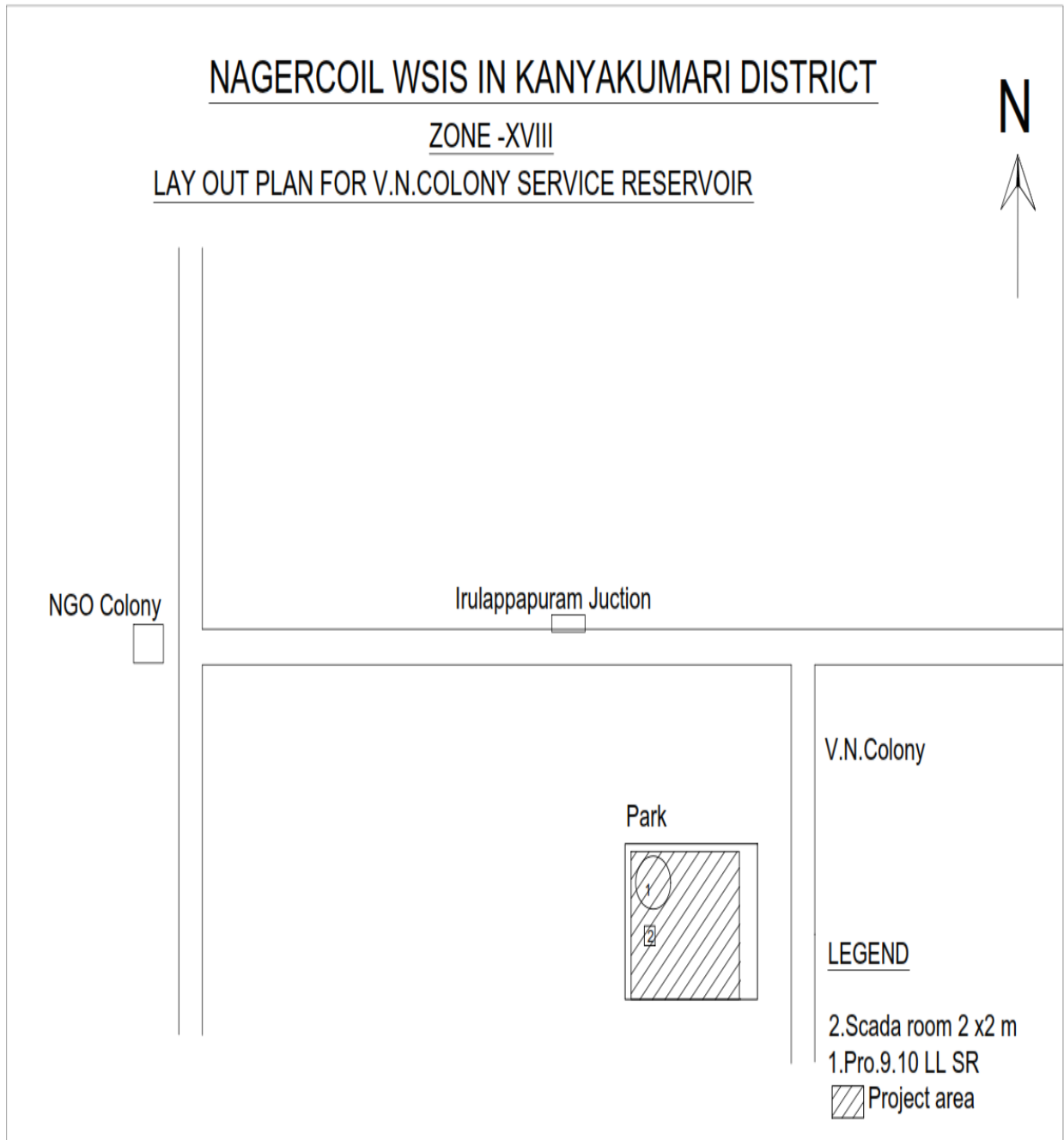


**Layout Plan for Ponnappanadar Colony Service Reservoir**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

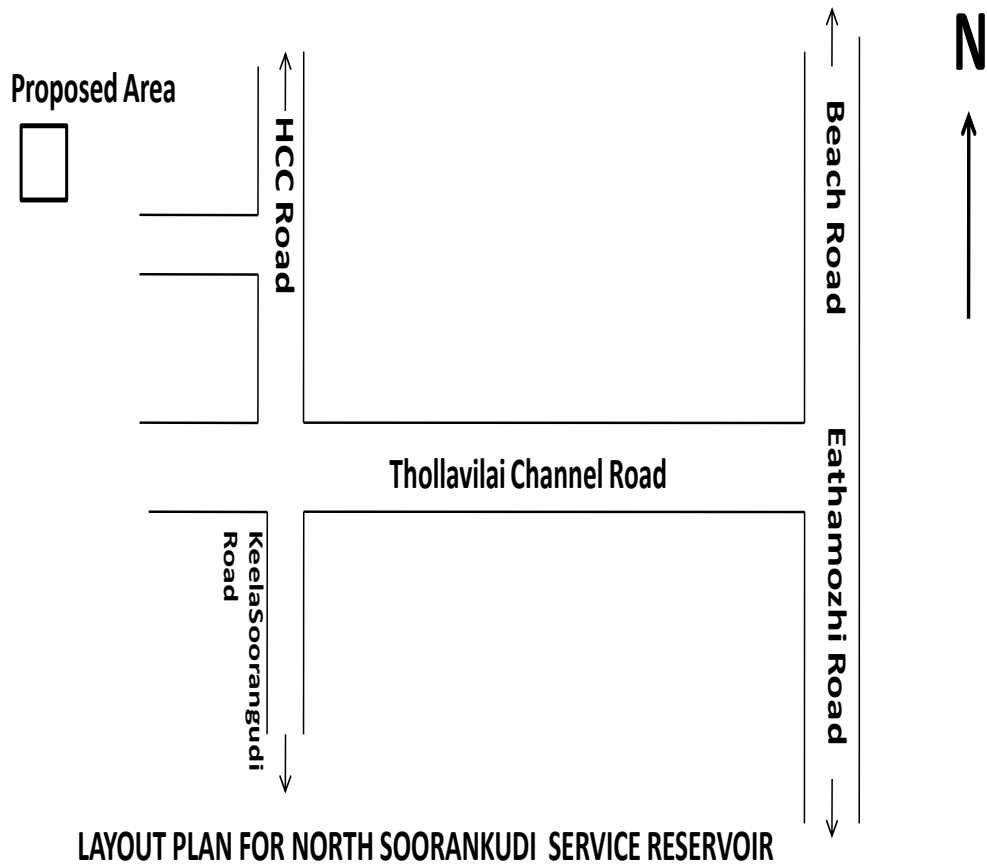
ZONE -XVIII

## LAY OUT PLAN FOR V.N.COLONY SERVICE RESERVOIR



**Layout Plan for V.N Colony Service Reservoir**

**NAGRECOIL WSIS IN KANYAKUMARI DISTRICT**  
**ZONE – XVI**  
**LAYOUT PLAN FOR NORTH SOORANKUDI SERVICE RESERVOIR 1.10LL**



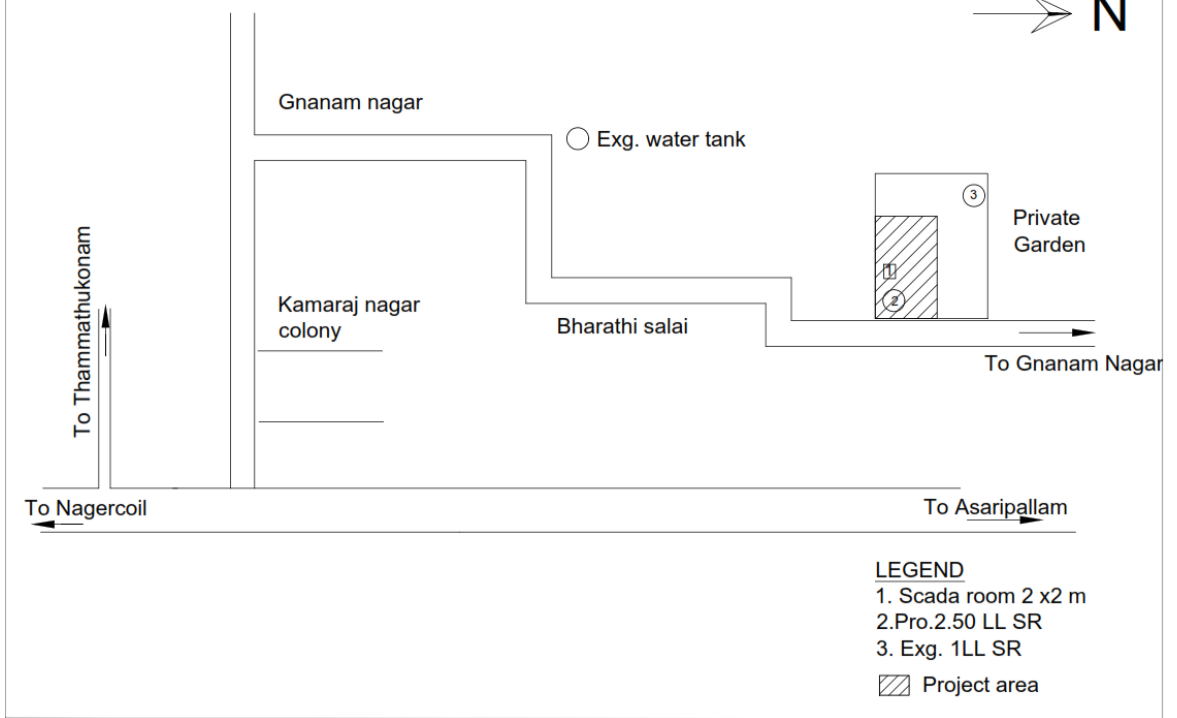
**LAYOUT PLAN FOR NORTH SOORANKUDI SERVICE RESERVOIR**

**Layout Plan for North Soorangudi Service Reservoir**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

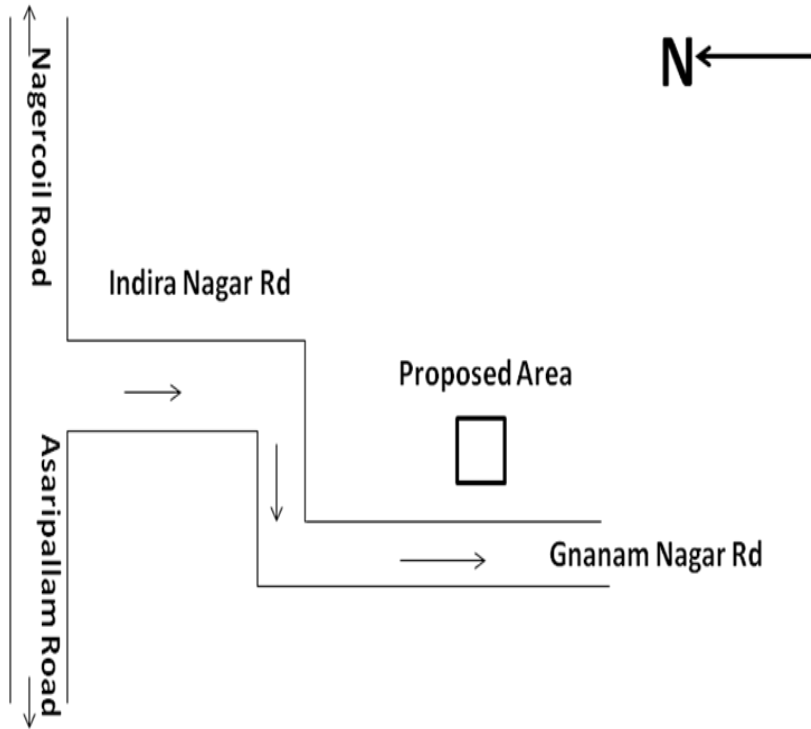
## ZONE -XIV A& B

### LAY OUT PLAN FOR GNANAM NAGAR SERVICE RESERVOIR



**Layout Plan for Gnanam Nagar Service Reservoir**

**NAGRECOIL WSIS IN KANYAKUMARI DISTRICT**  
**ZONE – XIII A&B**  
**LAYOUT PLAN FOR ASARIPALLAM SERVICE RESERVOIR 8.80LL**



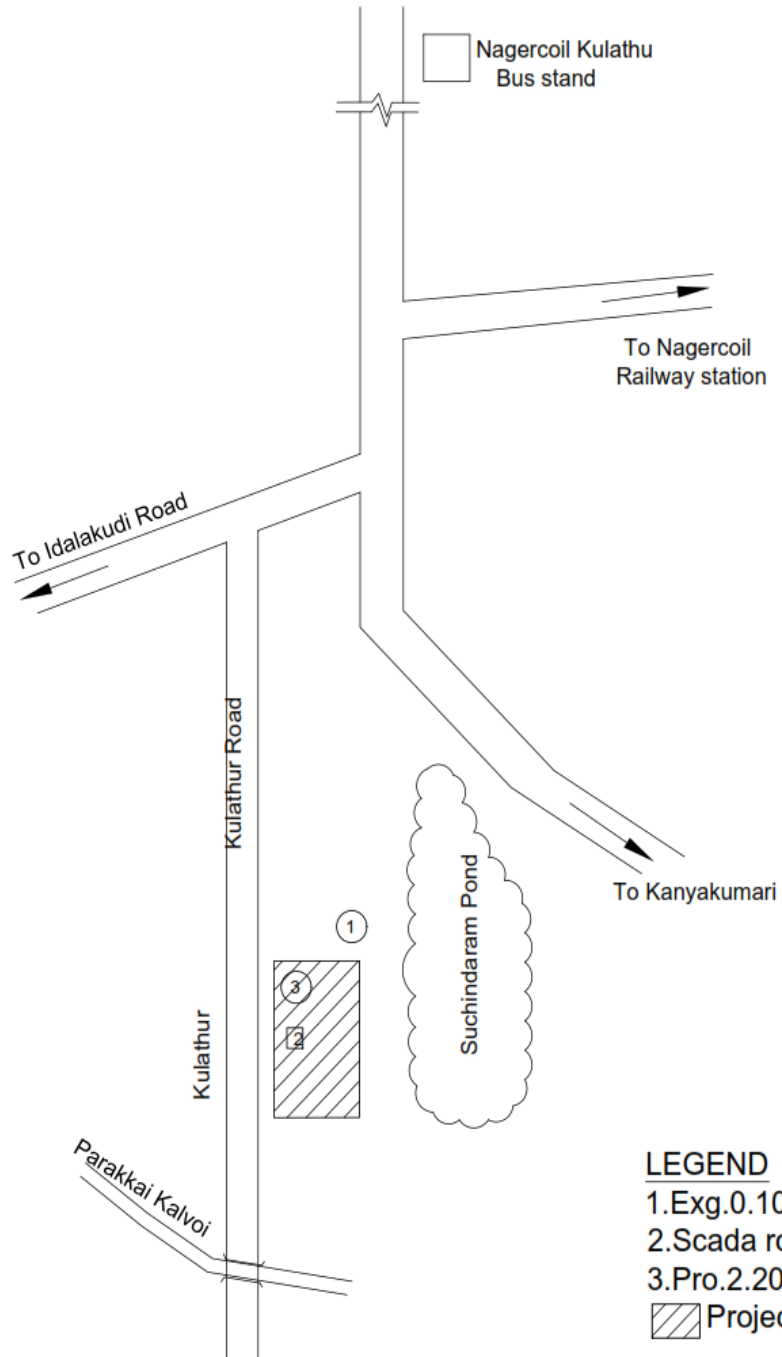
**LAYOUT PLAN FOR ASARIPALLAM SERVICE RESERVOIR**

**Layout Plan for Asaripallam (Medical College) Service Reservoir**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

ZONE -XX

## LAY OUT PLAN FOR KARIAMANICKAPURAM SERVICE RESERVOIR

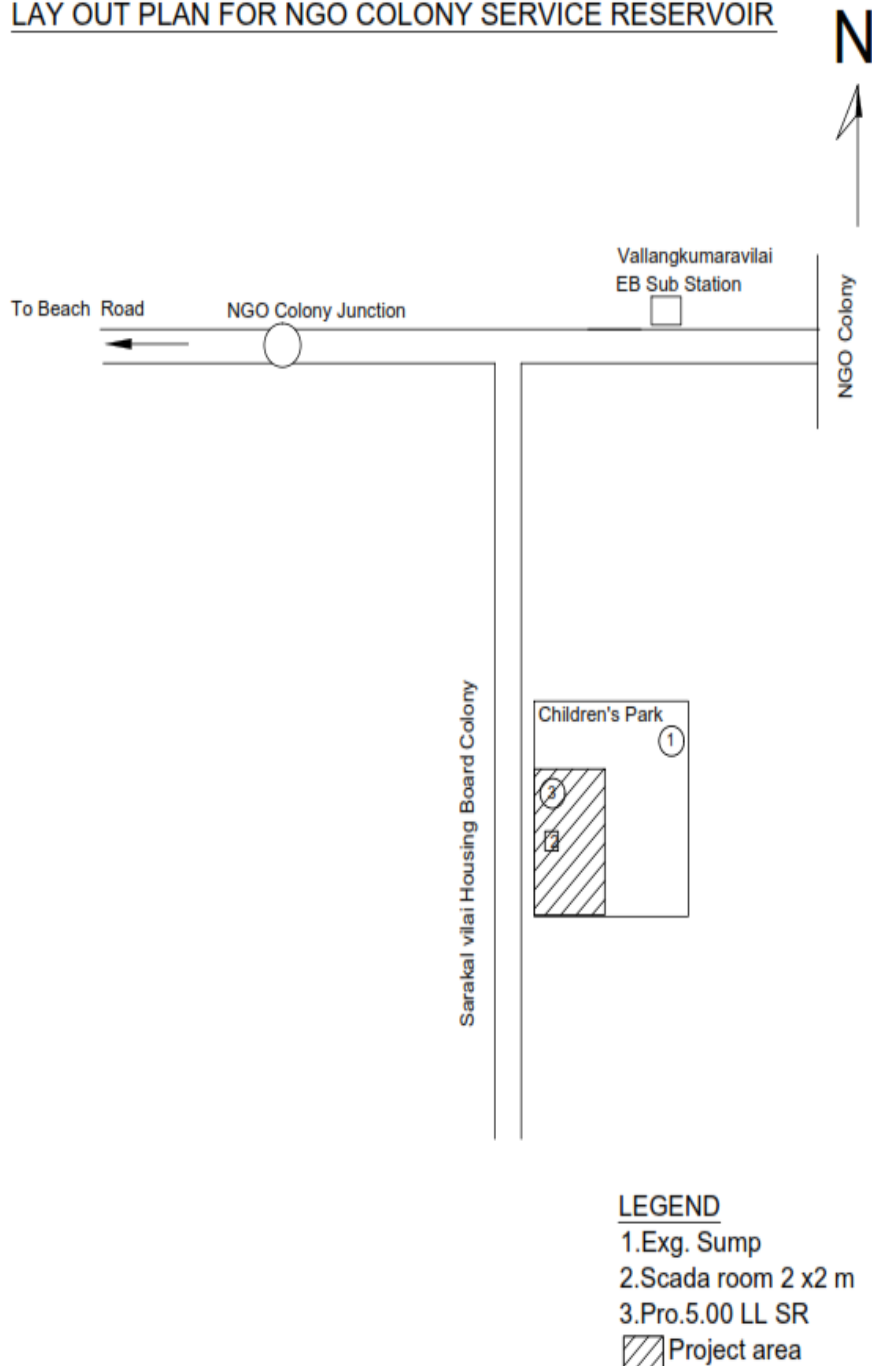


**Layout Plan for kariyamanikapuram Service Reservoir**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

## ZONE -XIX A & B

### LAY OUT PLAN FOR NGO COLONY SERVICE RESERVOIR



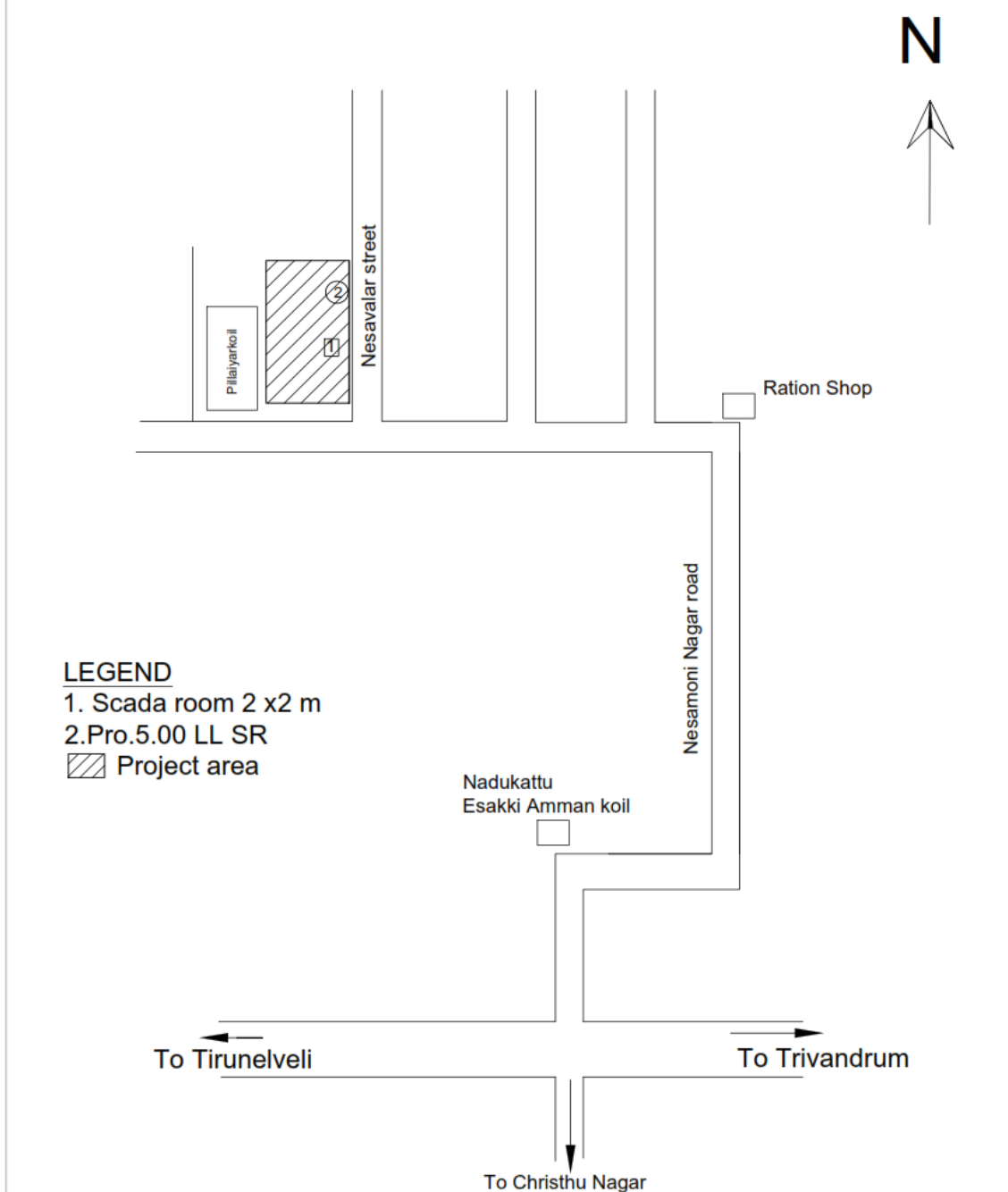
**Layout plan for NGO Colony Service Reservoir**



# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

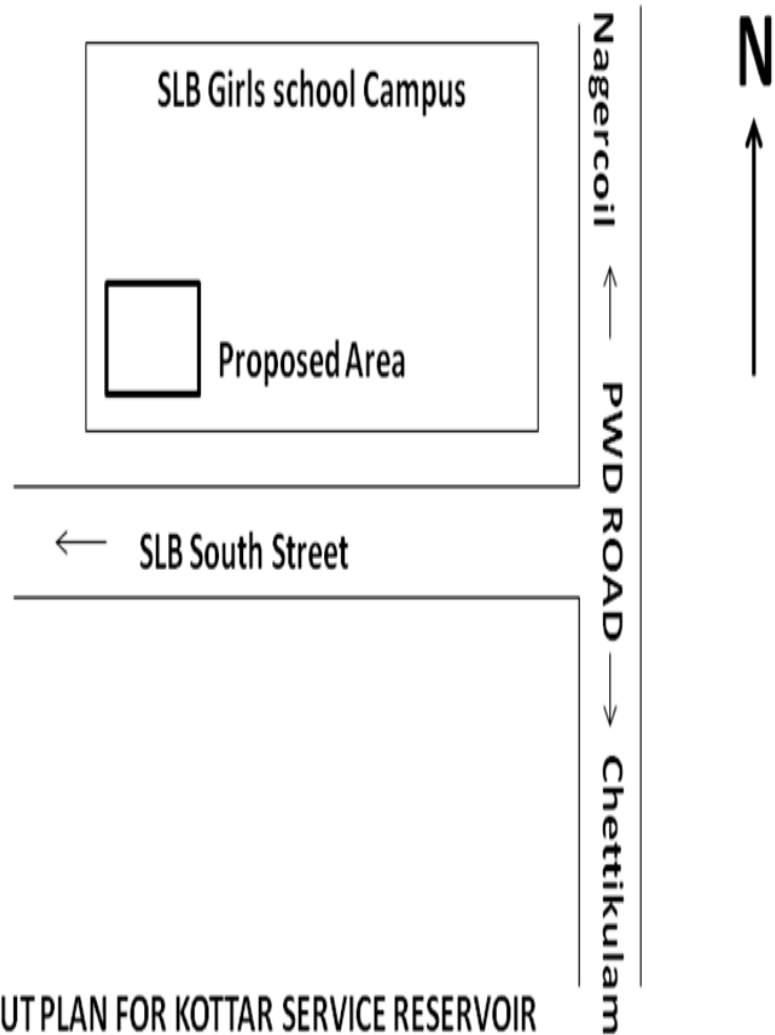
## ZONE -XII

### LAY OUT PLAN FOR NESAMONY NAGAR SERVICE RESERVOIR



**Layout Plan for Nasamony Service Reservoir**

**NAGRECOIL WSIS IN KANYAKUMARI DISTRICT**  
**ZONE – XXI**  
**LAYOUT PLAN FOR KOTTAR SERVICE RESERVOIR 8.80LL**

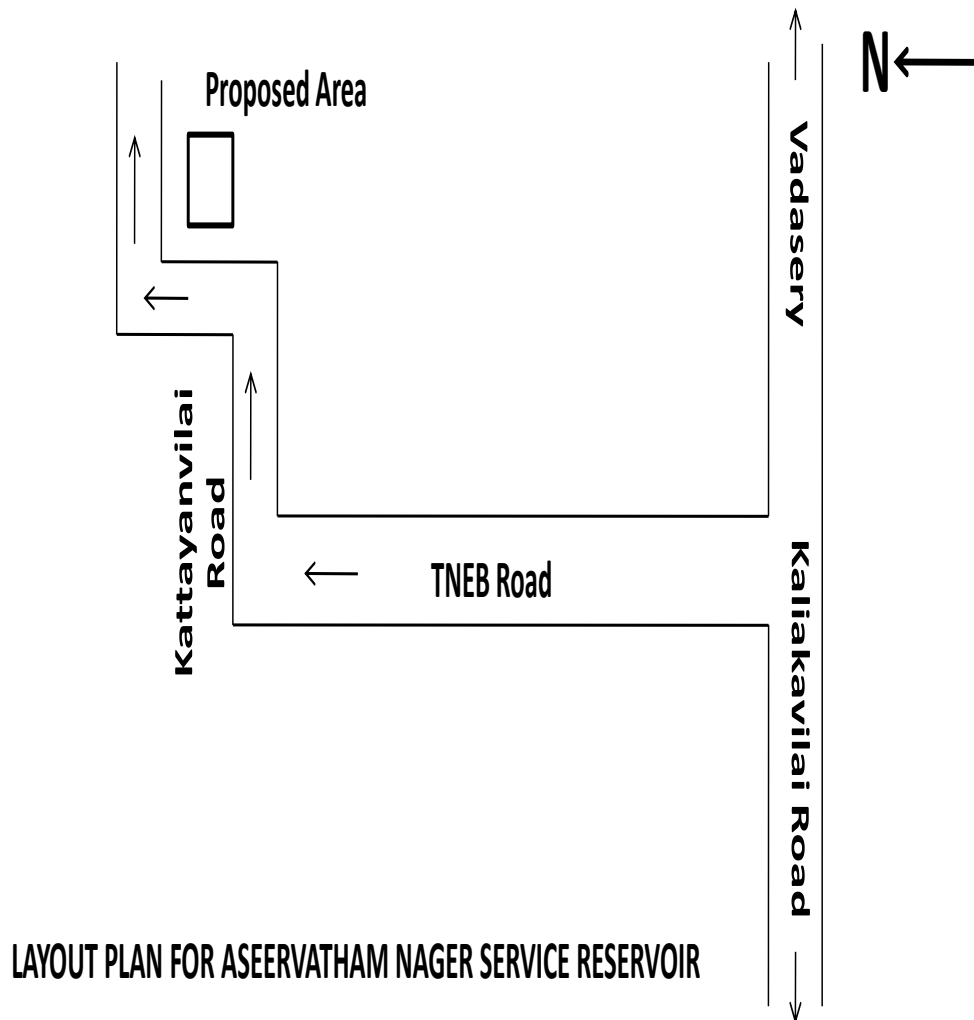


LAYOUT PLAN FOR KOTTAR SERVICE RESERVOIR

**Layout Plan for kottar Service Reservoir**

**NAGRECOIL WSIS IN KANYAKUMARI DISTRICT  
ZONE - XI**

**LAYOUT PLAN FOR ASEERVATHAM NAGER SERVICE RESERVOIR 2.40LL**



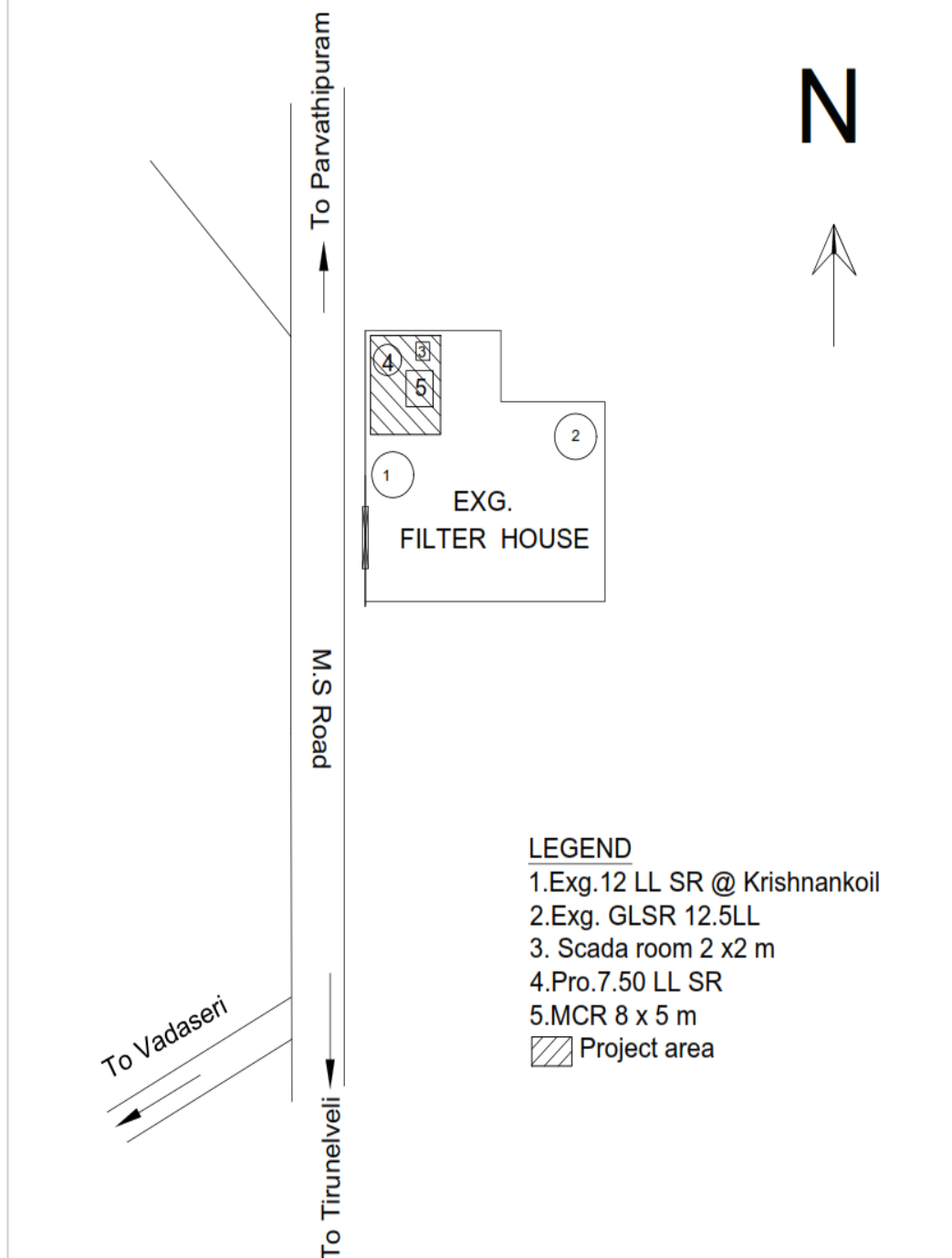
**LAYOUT PLAN FOR ASEERVATHAM NAGER SERVICE RESERVOIR**

**Layout Plan for Aseervatham Nagar Service Reservoir**

# NAGERCOIL WSIS IN KANYAKUMARI DISTRICT

## ZONE -X

### LAY OUT PLAN FOR KRISHNANKOIL SERVICE RESERVOIR



**Layout Plan for Krishnankovil Service Reservoir**

**ANNEXURE -IV**  
**SAFETY IN STORAGE AND HANDLING CHLORINE IN PLANT**  
**OPERATION**

**1. Introduction**

In order to keep the treatment units in disinfected condition and also to kill algae in the water, chlorine is proposed to dose at the raw water and clear water at two places. So, it is proposed to use 6 nos in filled condition at any point of time. The per day consumption of chlorine is around 300 Kg. So, the yearly consumption is 30 tonnes. The chlorination system is well equipped with leak detecting equipment to avoid and hazards.

Chlorine is potentially dangerous. It is, therefore, important that person engaged in a chlorine plant or in any activity involving handling of chlorine should understand the hazards of chlorine and should know preventive measures needed. Safety showers and eye washers and neutralization pits are provided for the safety of workmen and operators.

The instructions for handling and operations of the chlorine system are given below.

**2. Storage and Handling of Chlorine Cylinders**

Chlorine is stored in special grade steel containers. As per IS:4379-1967, the colour of Chlorine container should be 'golden yellow'. Chlorine cylinders of 100 Kg capacity will be suitable for the proposed WTP. It will be required to store about 3 cylinders at a time at the WTP. Instructions given in the 'Manual on Operation and Maintenance of Water Supply Systems' published by the Central Public Health and Environmental Engineering Organization (CPHEEO) in 2005 for the storage and handling of Chlorine cylinders is should be strictly followed for safe operation of the WTP.

**3. Health Hazards of Chlorine**

Wet chlorine being corrosive, it forms corrosive acid with body moisture. Inhalation can cause respiratory injury ranging from irritation to death depending upon its concentration and duration of inhalation. First aid - trained Personnel having the knowledge in the use of aid equipment and rendering artificial respiration should be available in the plant. First aid box with necessary contents should be available. Properly designed showers and eye fountains should be provided in convenient

locations and they should be properly maintained. If oxygen is available the same should be administered by authorized person.

#### **4. Fire & Explosion Hazards of Chlorine**

Chlorine may react to cause fires or explosions upon contact with turpentine, ether, ammonia gas, hydrocarbons, hydrogen, powdered metals, sawdust and phosphorus. Due to fire in the vicinity, the temperature of the containers rises excessively which results in explosion. In order to avoid explosion of the containers, remove all the movable containers from the fire zone immediately by wearing full protective clothing with respiratory protection. In the case of immovable containers, use water for cooling provided there is no leak.

#### **5. Emergency Response Planning**

When a large quantity of chlorine is stored it is essential to have an emergency response planning as leakage of Chlorine may lead to a major accident such as emission, fire or explosion, leading to serious danger to man, immediate or delayed, inside or outside the establishment and/or to the environment, and involving one or more dangerous substances. It has, therefore, become obligatory to take all measures necessary to prevent accidents and to limit their consequences for man and the environment. The hazard control can be achieved by drawing an effective 'on-semergency plan'.

#### **6. Neutralization of Chlorine**

A suitable provision should be available for emergency disposal of chlorine from the leaking container. Chlorine may be absorbed in solution of caustic soda, soda ash and hydrated lime. Caustic soda is recommended as it absorbs chlorine more readily. If hydrated lime is used, the slurry must be continuously agitated and recirculated for chlorine absorption. The neutralization can be carried out by Neutralization tank holding caustic soda or hydrated lime or sodium carbonate in solution form. This system can be used only after controlling the leaking container by emergency kit and connecting it to the Neutralization tank by inverted U tube of 11 m height. Do not push the leaking container in the alkali tank. It is recommended to provide a suitable tank to hold the alkali solution in a convenient location near the chlorination plant.

## **7. Personal Protective Equipment**

The following personal protective equipments can be used in case of a Chlorine leakage. Breathing Apparatus: Self-contained breathing apparatus, Air-line respirator or Industrial Canister Type Mask can be used as breathing apparatus, depending on the concentration of Chlorine in the atmosphere and the availability of Oxygen. Protective Clothing: Rubber or PVC clothing is useful in massive exposure which otherwise creates mild skin burns due to formation of acid on the body.

## **8. Acts and Rules Applicable for Handling of Chlorine**

The Gas Cylinder Rules 2004: Storage license from controller of explosives is to be obtained under Gas Cylinder Rules 2004 if the quantity of Cl<sub>2</sub> containers to be stored is more than 5 Nos. Since it is envisaged to store more than 3 cylinders at a time at the proposed WTP, storage license from controller of explosives need not to be obtained.

## **9. Occupational Health and Safety of WTP Operators**

### **9.1 Potential Hazards to Health and Safety**

In addition to the hazards of Chlorine, the WTP Operators will be exposed to a number of hazards such as:

- i) Electrical equipment,
- ii) Rotating mechanical equipment,
- iii) Water treatment chemicals such as Alum and Calcium Hydroxide,
- iv) Laboratory reagents (chemicals),
- v) Slippery surfaces caused by certain chemicals,
- vi) Flooding,
- vii) Confined spaces and underground structures such as valve or pump vaults (toxic and
- viii) explosives gases, insufficient oxygen), and
- ix) Continuous exposure to high noise level in the WTP leading to hearing impairment

### **9.2 Management of Hazards to Health and Safety**

Selection of WTP Employees: Pre-placement medical examination should be carried out of the persons to confirm that they are free from Asthma, Bronchitis and other chronic lung conditions. Follow up medical examination should be carried out once in a year.

Training for Employees: It is essential to impart training to the employees who have to face emergency.

This training should include following:

Instructions in the action to be taken in an emergency,

- i) Use of emergency kit,
- ii) Handling of containers,
- iii) First aid,
- iv) Use of protective equipment,
- v) Knowledge of Chlorine hazards,
- vi) Firefighting,
- vii) Use of safety showers and eye fountains,
- viii) Crash shut down procedure for valves and switches,
- ix) Communication system, and
- x) Study of plant layout with diagram.

The Operator should use appropriate hearing protectors to prevent noise-induced hearing loss caused by exposure to loud and prolonged noise in the pump rooms. The WTP should have an Operation and Maintenance Manual with appropriate safety procedures.

### **Instructions for Handling of Chlorine Gas Operations**

1. Provide proper instruction and supervision to workers responsible for chlorine equipment.
2. Provide proper and approved self-contained breathing apparatus in areas where chlorine is stored or used.
3. Keep all breathing apparatus stored outside the chlorine area.
4. Prepare escape plans from areas where there might be a chlorine emission. Remember to move uphill and upwind.
5. Never store combustible or flammable materials near chlorine containers.
6. Never apply heat directly to a chlorine container.
7. Never attempt to weld an "empty" chlorine pipe line without purging it with air first.
8. Install safety showers and eye wash stations near chlorine equipment.
9. If there is a leak, at least two persons should make the repairs.
10. Never spray water on leaking containers; it can make the leak worse.



11. When entering an equipment area, take shallow breaths until you are sure that there is not a chlorine gas leak.

12. Rely upon chlorination equipment for direct disposal of chlorine gas.

13. Secure chlorine containers with chains, chocks, or trunnions.

**When using chlorine, personal protective clothing should include:**

1. Full face shield or non-ventilated chemical goggles;

2. Chemically resistant rubber gloves;

3. Apron or jacket; and

4. Long sleeves and trousers.

5. Open shoes and sneakers should be prohibited when handling chlorine.

**General Directions for First Aid**

1. Keep the victim lying down.

2. Examine the victim - look for serious bleeding, lack of breathing, and poisoning.

3. Keep the victim warm.

4. Send someone to call a physician or ambulance.

5. Remain calm. Do not be rushed into moving the victim unless absolutely necessary.

6. Never give an unconscious victim anything to eat or drink.

7. Keep the crowd away from the victim.

8. Ensure the victim is comfortable and cheerful.

9. Don't allow the victim see his injury.

**ANNEXURE V**  
**PUBLIC CONSULTATION DETAILS**



**Public Consultation Photo**

# புத்தன் அணை குடிநீர் திட்டம் செப்டம்பர் மாதம் முடிவடையும்

நாகர்கோவில் மாநகராட்சி ஆணையர் தகவல்

நாகர்கோவில், ஏப்.18-

நாகர்கோவில் மாநகராட்சி மற்றும் தமிழ்நாடு குடிநீர் வழங்கல் துறை சார்பில் புத்தன் அணை குடிநீர் திட்டப்பணிகள் குறித்து கலந்தாய்வு கூட்டம் மாநகராட்சி அலுவலகத்தில் நடந்தது. இதற்கு மாநகராட்சி ஆணையர் ஆஷா அஜித் தலைமை தாங்கினார். மாநகர என்ஜினீயர் பாலசுப்பிரமணியம், குடிநீர் வடிகால் வாரிய உதவி செயற்பொறியாளர் கதிர்சன் ஆகியோர் முன்னிலை வகித்தனர். பொதுமக்கள் சார்பில் நுகர்வோர் சங்க நிர்வாகிகள், குடியிருப்போர் நல சங்க கூட்டமைப்பு நிர்வாகிகள் கலந்து கொண்டு, புத்தன் அணை திட்டம் எப்போது முடியும். இத்திட்டம் அமலுக்கு வரும்போது, தனியாருக்கு கொடுத்து கட்டணம் வசூலிக்க போவதாக தகவல்கள் வருகிறதே? என கேட்டனர்.

அதற்கு மாநகராட்சி ஆணையர் ஆஷா அஜித் மற்றும் அதிகாரிகள் பதில் அளிக்கையில், புத்தன் அணை திட்டப்பணிகள் வருகிற செப்டம்பர் மாதம் முடிவடையும். தனியார் மூலம் தண்ணீர் வினியோகம் செய்யப்படாது. கூடுதலாக மேல்நிலை நீர்தேக்க தொட்டிகள் அமைக்க இருப்பதால், மாநகராட்சி பகுதியில் சீரான குடிநீர் வினியோகம் நடைபெறும் என்று கூறினர்.