

**Annexure 2-1: Applicable Environment Standards / Norms****A. CPCB Best Designated Use Standards for Water**

Designated-Best-Use	Class of water	Criteria
Drinking Water Source without conventional treatment but after disinfection	A	Total Coliforms Organism MPN/100ml shall be 50 or less
		pH between 6.5 and 8.5
		Dissolved Oxygen 6 mg/l or more
		Biochemical Oxygen Demand 5 days 20°C 2mg/l or less
Outdoor bathing (Organized)	B	Total Coliforms Organism MPN/100ml shall be 500 or less pH between 6.5 and 8.5
		Dissolved Oxygen 5 mg/l or more
		Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Drinking water source after conventional treatment and disinfection	C	Total Coliforms Organism MPN/100ml shall be 5000 or less
		pH between 6 to 9
		Dissolved Oxygen 4mg/l or more
		Biochemical Oxygen Demand 5 days 20°C 3mg/l or less
Propagation of Wild life and Fisheries	D	pH between 6.5 to 8.5 Dissolved Oxygen 4mg/l or more
		Free Ammonia (as N) 1.2 mg/l or less
Irrigation, Industrial Cooling, Controlled Waste disposal	E	pH between 6.0 to 8.5
		Electrical Conductivity at 25°C micro mhos/cm Max.2250
		Sodium absorption Ratio Max. 26
		Boron Max. 2mg/l
	Below-E	Not Meeting A, B, C, D & E Criteria

**B. Ambient Air Quality Standards:**

The MoEF&CC has the overall responsibility to set policy and Standards for the protection of environment along with Central Pollution Control Board (CPCB). Ambient Air Quality Standard given below:

**Revised National Ambient Air Quality Standards (16<sup>th</sup> November 2009)**

Pollutants	Time Weighted Average	Concentration in Ambient Air	
		Industrial, Residential, Rural, other areas	Ecologically Sensitive Area (Notified by Central Government)
Sulphur Dioxide (SO <sub>2</sub> ), µg/m <sup>3</sup>	Annual * 24 Hours **	50 80	20 80
Nitrogen Dioxide (NO <sub>2</sub> ), µg/m <sup>3</sup>	Annual * 24 Hours **	40 80	30 80
PM <sub>10</sub> , µg/m <sup>3</sup>	Annual * 24 Hours **	60 100	60 100
PM <sub>2.5</sub> , µg/m <sup>3</sup>	Annual * 24 Hours **	40 60	40 60
Ozone (O <sub>3</sub> ) µg/m <sup>3</sup>	8 Hours * 1 Hour **	100 180	100 180
Lead (Pb) µg/m <sup>3</sup> in particulate matter	Annual * 24 Hours **	0.50 1.0	0.50 1.0
Carbon Monoxide (CO), mg/m <sup>3</sup>	8 Hours ** 1 Hour **	02 04	02 04
Ammonia (NH <sub>3</sub> ), µg/m <sup>3</sup>	Annual * 24 Hours **	100 400	100 400
Benzene (C <sub>6</sub> H <sub>6</sub> ), µg/m <sup>3</sup>	Annual *	05	05
Benzo(a)Pyrene (BaP) ng/m <sup>3</sup> in particulate matter	Annual *	01	01
Arsenic (As), ng/m <sup>3</sup> in particulate matter	Annual *	06	06
Nickel (Ni), ng/m <sup>3</sup> in particulate matter	Annual *	20	20

\* Annual Arithmetic mean of minimum 104 measurements in a year at a particular site taken twice a week 24 hourly at uniform intervals.

\*\* 24 hourly or 8 hourly or 1 hourly monitored values, as applicable, shall be complied with 98% of the time in a year. 2% of the time, they may exceed the limits but not on two consecutive days of monitoring.

### C. Ambient Noise Standards:

Ambient standard with respect to noise have been notified by the Ministry of Environment and forest vide gazette notification dated 26<sup>th</sup> December 1989(amended in February 2000). It is based on "A" weighted equivalent noise level (Leq). The ambient noise standards are presented in table below:

**Ambient Noise Quality Standards**

Area code	Category of Area	Limits in dB(A) Leq	
		Day Time	Night Time
A	Industrial Area	75	70
B	Commercial Area	65	55
C	Residential Area	55	45
D	Sensitive Area	50	40

Note: \*Day time is from 6 am to 10 pm, Night time is 10 pm to 6.00 am; \*\* Silence zone is defined as area up to 100 meters around premises of hospitals, educational institutions and courts. Use of vehicle horns, loud speakers and bursting of crackers are banned in these zones.

### D. Ground Water Quality Standards

#### Standards For Drinking Water (IS:10500)

	Parameters	Unit	Acceptable Limit IS:10500	Permissible Limit IS:10500
1	Colour	Hazen units	5	15
2	Odour	-	Agreeable	Agreeable
3	Taste	-	Agreeable	Agreeable
4	Turbidity	NTU	1	5
5	Total Dissolved Solids	mg/l	500	2000
6	pH	-	6.5 to 8.5	No Relaxation
7	Total Hardness as CaCO <sub>3</sub>	mg/l	200	600
8	Iron as Fe	mg/l	0.3	No Relaxation
9	Aluminium	mg/l	0.03	0.2
10	Copper as Cu	mg/l	0.05	1.5
11	Manganese as Mn	mg/l	0.1	0.3
12	Zinc as Zn	mg/l	5	15
13	Magnesium as Mg	mg/l	30	No Relaxation
14	Barium	mg/l	0.7	No Relaxation
15	Calcium as Ca	mg/l	75	200
16	Silver	mg/l	0.1	No Relaxation
17	Selenium as Se	mg/l	0.01	No Relaxation
18	Molybdenum	mg/l	0.07	No Relaxation
19	Boron	mg/l	0.5	1.0
20	Nitrates as NO <sub>3</sub>	mg/l	45	No Relaxation
21	Sulphate	mg/l	200	400
22	Sulphide	0.01	No Relaxation	
23	Fluoride as F	mg/l	1.0	1.5
24	Chlorides as Cl	mg/l	250	1000
25	Ammonia	mg/l	0.5	No Relaxation
26	Chloramines	mg/l	0.2	No Relaxation

	Parameters	Unit	Acceptable Limit IS:10500	Permissible Limit IS:10500
27	Residual, Free chlorine	mg/l	0.2	1.0
28	Total Alkalinity as calcium carbonate	mg/l	200	600

### E. Soil Quality

#### Standard Soil Classification

Sr. No.	Soil test	Classification
1.	Ph	5.51 - 6.0 Moderately acidic 6.01 - 6.50 Slightly acidic 6.51 - 7.30 Neutral 7.31 - 7.80 Slightly alkaline 7.81 - 8.50 Moderately alkaline
2.	Salinity as electrical conductivity (milli mhos/cm)	Upto 1.00 Average 1.01-2.00 Harmful to germination 2.01-3.00 Harmful to crops
3.	Organic carbon (%)	0.21-0.4 Less 0.41-0.5 Medium 0.51-0.8 On an average sufficient 0.81-1.00 sufficient
4.	Nitrogen (kg/ha)	51-100 Less 101-150 Good 151-300 Better >300 Sufficient
5.	Phosphorus (kg/ha)	16-30 Less 31-50 Medium 51-65 On an average sufficient
6.	Potassium (kg/ha)	120-180 Less 181-240 Medium 241-300 Average 301-360 Better

### F. World Bank Group Environmental, Health, and Safety (EHS) Guidelines

Carbon Monoxide (CO)	-
Nitric Oxide(NO)	40(Annual)
Nitrogen dioxide (NO <sub>2</sub> )	
Sulphur dioxide (SO <sub>2</sub> )	(24 hour) 20
Ozone (O <sub>3</sub> )	100(8 hour)
Particulate Matter (PM <sub>10</sub> )	(24 hour) 50
Particulate Matter (PM <sub>2.5</sub> )	(24 hour) 25
Temperature	-
Humidity	-

### G. World Bank Group EHS Standards for Noise

Area Category	Standard Values in dBA
Residential, institutional, educational area	55
Commercial and industrial area	70

**E. Standards for Air Emissions MARPOL Annex VI -Applies to All Vessels**

Vessel/Voyage type/Area	Sub-Category	Discharge Conditions
All vessels	Ozone-depleting substances	Prohibited
	Nitrogen Oxides	Operation of diesel engines >130kW prohibited unless engine is certified to meet prescribed emission standards. New Engines: • Tier I - 17 g/kW from 1 January 2000 • Tier II - 14.4 g/kW from 1 January 2011 • Tier III - 3.4 g/kW from 1 January 2016 (in Emission Control Areas (ECA)) Existing Engines (installed on ship on or between 1 January 1990 to 1 January 2000) • 17g/kW for diesel engine with power output >5000kW and displacement per cylinder => 90 litres • Approved method by Administration
	Sulphur Oxides	Sulphur content of fuel oil not to exceed 4.5%. ** From 1 January 2012, sulphur content of fuel oil not to exceed 3.5% ** From 1 January 2020 sulphur content of fuel oil not to exceed 0.5% ** ** Fuel oil to be purchased from a registered supplier Note: Feasibility review to be completed 2018
	Incinerators	Incinerators installed after 1 January 2000 must be type approved and certified to meet prescribed emission standards. Do not use within port limits

**F Standards for Wastewater Discharge, MARPOL(Annex IV)**

Vessel/Voyage type/Area	Sub-Category	Discharge Conditions
All vessels (other than passenger ships within special areas)	Comminute and disinfected sewage using an approved system in accordance with regulation 9.1.2 of MARPOL Annex IV	Permitted as long as no less than 3 nm from nearest land; and Sewage originating from holding tanks, or sewage originating from spaces containing live animals is discharged at a moderate rate* while the ship is proceeding en route at a speed not less than 4 knots. * The rate of discharge shall be approved by the Administration based upon standards approved by the Organisation. Recommended standards for the rate of discharge of sewage from ships can be found in Marine Order 96.
All vessels (other than passenger ships within special areas)	Sewage not comminuted or disinfected	Permitted as long as no less than 12 nm from nearest land; and Sewage originating from holding tanks, or sewage originating from spaces containing live

		<p>animals is discharged at a moderate rate* while the ship is proceeding en route at a speed not less than 4 knots</p> <p>* The rate of discharge shall be approved by the Administration based upon standards approved by the Organisation. Recommended standards for the rate of discharge of sewage from ships can be found in Marine Order 96</p>
<p>All vessels (other than passenger ships within special areas) on International voyages to and continuing in Australian waters</p>	<p>Treated sewage effluent discharged through an approved Sewage Treatment Plant (STP) certified by the Administration to meet the operational requirements referred to in regulation 9.1.1 of MARPOL Annex IV</p>	<p>Permitted provided: Effluent does not produce visible floating solids nor cause discolouration of the surrounding water Local laws may prohibit discharges in ports Additionally: When within port limits, check with port authority as permission may be required All vessels should ensure that the STP is operating at optimum performance when in Australian waters Food or biological waste removed from filtration units of vessels on international voyages is prohibited from discharge within 12nm from land (DAFF requirements)</p>
<p>Passenger ships within special areas* * further information on special areas can be found in circular MEPC.1/Circ.778/Rev.1</p>	<p>Treated sewage effluent from new passenger ships on, or after 1 January 2016 and for existing passenger ships on, or after 1 January 2018</p>	<p>Permitted provided: The ship has in operation an approved sewage treatment plant certified by the Administration to meet the operational requirements referred to in regulation 9.2.1 of MARPOL Annex IV; and Effluent does not produce visible floating solids nor cause discolouration of the surrounding water. Note: local laws may prohibit discharges in ports</p>
<p>Great Barrier Reef Marine Park Vessels on International voyages to and continuing in Australian waters</p>	<p>All sewage discharges</p>	<p>In accordance with Annex IV requirements and where applicable with any additional restrictions imposed as conditions of a GBRMP permit</p>
<p>Great Barrier Reef Marine Park Vessels on domestic voyages</p>	<p>All sewage discharges</p>	<p>Recommended to comply with MARPOL Annex IV Or, in accordance with requirements of Part 3A of the GBRMPA Regulations (93A-93G) for both treated and untreated sewage AND, where applicable, in</p>

		accordance with any additional restrictions imposed as conditions of a GBRMP permit
Queensland State Waters (small vessels/State registered and recreational)	If vessel does not have a sewage treatment system on board, options include: Using onshore toilet facilities whenever possible Using a portable toilet to be later emptied to a sewerage/septic system Retain sewage in on board holding tank for pumping out to shore facilities.	If a vessel has 16 or more persons on board, no discharge of untreated sewage is permitted anywhere in Queensland waters. If a vessel has 7 to 15 persons on board, no discharge of untreated sewage is permitted within 1 nm of a reef or the mean low water mark of an island or the mainland. No discharge of untreated sewage is permitted within 1 nm of aquaculture fisheries resources, or within 0.5 nm of a wharf or jetty other than a jetty that is a marina.

#### G. Standards for Garbage Management, MARPOL (Annex V- Applies to All Vessels)

Type of garbage	Ships outside special areas	Ships within special areas <sup>1</sup>	Offshore platforms (more than 12nm from land) and all ships within 500m of such platforms
Food <sup>2</sup> waste comminute or ground to particle size < 25mm	Discharge permitted, while enroute, as far as practicable from the nearest land, but in any case, ≥ 3nm from the nearest land.	Discharge permitted, while enroute <sup>3</sup> , as far as practicable from the nearest land, but in any case, ≥ 12nm from the nearest land.	Discharge permitted
Food <sup>2</sup> waste not comminute or ground	Discharge permitted, while enroute <sup>3</sup> , as far as practicable from the nearest land, but in any case, ≥ 12nm from the nearest land.	Discharge prohibited	Discharge prohibited
Cargo residues <sup>4</sup> that cannot be recovered using commonly available methods for unloading, not contained in wash water	Discharge permitted, while enusing commonly available methods for unloading, not contained in wash water	Discharge Prohibited	Discharge prohibited
Cargo residues <sup>5</sup> that cannot be recovered using commonly available methods for unloading, contained in wash water		Discharge permitted, while enroute, as far as practicable from the nearest land, but in any case, ≥ 12nm from the nearest land. Subject to two additional conditions <sup>6</sup> .	

### H: Standards for Oily Wastes, MARPOL Annex I - Applies to All Vessels

Vessel/Voyage type/Area	Sub-Category		Discharge Conditions	
For more information and definitions refer to MARPOL consolidated edition 2011* * Can be purchased at „www.imo.org/Publications”.				
Oil tankers All waters	Oily waste from cargo tanks		More than 50 nautical miles from the nearest land; and Tanker is proceeding en route; and Instantaneous rate of discharge < 30 litres per nautical mile; and Total quantity discharge does not exceed 1/15,000 or1/30,000 of the total cargo (depending on the age of the vessel); and Oil discharge monitoring and control system and slop tank arrangement to be operating.	
All vessels > 400 gross tons All waters	Machinery space bilges		Proceeding en route; and Oil content less than 15 parts per million; and Oil discharge monitoring and control system and oil filtering equipment to be operating In some circumstances, oil or oily mixtures, may be retained onboard for discharge to port reception facilities – see MARPOL Annex I, Regulation 14. Note: 15ppm discharges can be anywhere at sea (not within port limits) including the Great Barrier Reef Marine Park and Marine Protected Areas. Vessel must not be stationary when undertaking discharge.	
All vessels <400 gross tons All waters	Machinery space bilges		Oil and all oily mixtures retain onboard for on shore disposal OR Proceeding en route; and Has in operation equipment of a design approved by the administration that ensures oil content less than 15 parts per million. Note: 15ppm discharges can be anywhere at sea (not within port limits) including the Great Barrier Reef Marine Park and Marine Protected Areas. Vessel must not be stationary when undertaking discharge.	
Vessels operating in Great Barrier Reef Marine Park	Bunkering utilising ship to ship transfers		A Permit is required from GBRMPA under which certain conditions may be imposed.	
Cargo materials contained in cargo hold bilge water	Discharge permitted, from a loaded hold through the ships" fixed piping bilge drainage system.		Discharge prohibited	
Cleaning agents and additivescontained in cargo hold wash water	Discharge permitted	Discharge permitted, while en route, as far as practicable from the nearest land, but in any case, ≥ 12nm from the nearest land. Subject to two additional conditions.	Discharge prohibited	
Cleaning agents and additives in deck and external surfaces wash water	Discharge permitted	Discharge prohibited		



Carcasses of animals carried on board as cargo and which died during the voyage	Discharge permitted, while en route, as far as practicable from the nearest land and at maximum water depth, but in any case, $\geq 100\text{nm}$ from the nearest land.	Discharge prohibited	Discharge prohibited
Grey water	Discharge permitted <sup>9</sup>	Discharge permitted <sup>9</sup>	Discharge permitted
All other garbage including plastics, synthetic ropes, fishing gear, plastic garbage bags, incinerator ashes, clinkers, cooking oil, floating dunnage, lining and packing materials, paper, rags, glass, metal, bottles, crockery and similar refuse	Discharge prohibited	Discharge prohibited	Discharge prohibited
Mixed garbage	When garbage is mixed with or contaminated by other substances prohibited from discharge or having different discharge requirements, the more stringent requirements apply.		
Note: The above conditions apply except where the disposal of garbage from a ship is necessary for the purpose of securing the safety of a ship and those on board or saving life at sea – see MARPOL Regulation 7.1.1			