

## **Impact of Lockdown on the air quality of Sikkim and status of Bio Medical Waste in relation to COVID-19.**

The State Pollution Control Board has been designated as an essential health service as per the order dated 21/04/2020 of the Hon'ble National Green Tribunal in the matter of O.A. No. 72/2020 Scientific Disposal Bio-Medical Waste (BMW) arising out of COVID-19 treatment – Compliance of BWM Rules, 2016. Therefore the SPCB-Sikkim has been vested with the duties of monitoring of compliance of the Guidelines for handling, treatment & disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients prepared by the Central Pollution Control Board. Accordingly, the Board has directed all the healthcare facilities that the Guidelines for handling, treatment & disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients be strictly implemented to ensure that the outbreak does not spread due to improper disposal of contaminated waste generated from quarantine or isolation centres. The guidelines further specify establishment /operation of COVID-19 sample collection & testing laboratories and the same should be informed to the SPCB/PCC of the state.

The Government of Sikkim had imposed lockdown in the state from 1<sup>st</sup> week of March, 2020 before the Central Government on 25/03/2020. This pre-emptive step resulted in the state being free of any COVID19 cases for almost a period of 2 months. The Government of Sikkim then took a massive undertaking to bring back all the citizens of the state stranded in various other parts of the country. However, the safety precautions were not laxed at any point of time. All returnees are to undergo 14 days of institutional quarantine and 14 days of home quarantine (a total of 28 days) to ensure controlled monitoring in case symptoms develop. All returnees who are undergoing institutional quarantine are also tested once. The State Government is taking meticulous and elaborate steps through the SPCB-Sikkim, Health and Family Welfare Department, District Administration & Urban Local Bodies to ensure the waste generated from isolation facility and quarantine centres is scientifically collected, treated and disposed to avoid spreading of COVID19 through contaminated waste.

The SPCB-Sikkim in order to ensure complete compliance of the guidelines has conducted meetings with Gangtok Municipal Corporation on who are responsible for collecting waste from quarantine facilities in the GMC area. Meeting with representatives of Department of Health and Family Welfare, Government of Sikkim with regard to proper management and disposal of BMW generated from COVID-19 facilities were conducted on 04/05/2020, 06/02/2020 and 27/05 2020. To ensure that the quarantine facilities (where stranded citizens were undergoing quarantine who might develop symptoms during 14 day process) do not cause any further contamination, the SPCB-Sikkim has brought out a set of guidelines for proper management & disposal of general waste and BMW generated from each facility. The records to be maintained and proper channel for disposal has been included in the guidelines. The State of Sikkim does not have a Common Bio Medical Waste Treatment Storage & Disposal Facility. Therefore to combat that shortcoming the SPCB-Sikkim has authorized four district hospitals, Central Referral Hospital Manipal and STNM Multi Speciality Hospital, Sochaygang for the purpose of disposal of BMW generated from COVID19 facilities.

The SPCB-Sikkim has assigned officers of deputy level and above as nodal officers for each district to monitor the waste generated from quarantine facilities and isolation wards. The nodal officers have visited the district hospitals and apprised the district administration with regard to the guideline and safety precautions to be undertaken to avoid spreading of the disease through contaminated waste. The district

administration, quarantine facilities incharges, healthcare facilities and line department provide waste generation data to the Board on a daily basis as per the generation. The SPCB-Sikkim is monitoring and compiling data for onward submission to CPCB on a weekly basis. The SPCB-Sikkim in co-ordination with Department of Health and Family Welfare has provided sensitization to waste handlers on proper safety measures to be undertaken during collection of waste from quarantine facilities. PPE have also been distributed to the said manpower by the SPCB-Sikkim. The SPCB-Sikkim has also apprised the waste generators with regard to the app created by CPCB for daily record of BMW management. The SPCB-Sikkim urges all the citizens who are under institutional or home quarantine to ensure that all personal protective equipment are disposed off separately and are not mixed up with the domestic solid waste. Further, SPCB-Sikkim appeals to all the citizens of the state to use masks compulsorily and then destroy it after its use for proper disposal of the same in scientific manner to further prevent its reuse.

A single isolation and treatment facility has been set up in STNM Multi Speciality Hospital. All the waste generated from the treatment of the patients are collected, treated and disposed in a scientific manner. The data with regard to COVID19 waste is provided in the Table 1 and the BMW generated from quarantine facility is provided in Table 2.

**Table 1: COVID19 waste generated from isolation wards from 25<sup>th</sup> may to 10<sup>th</sup> June,2020**

Name of State: Sikkim

No: of COVID-19 cases –13.

Sl. No.	Date	No of Districts generating COVID-19 waste	No of HCFs having Isolation wards	No of Quarantine Camps/Homes or Home Care Facilities	Quantity of COVID waste generated (Kg/day)	No of CBWTFs engaged in management of COVID waste	Quantity of COVID-19 waste disposed per day	Any Issues in COVID waste Management / Short-comings w.r.t implementation of CPCB guidelines
1.	23/05/2020	01	03	69	16 kg.	The state does not have a dedicated CBWTF. Therefore, the SPCB has authorized District Hospitals, STNM Multispecialty and Manipal Central Referral Hospital for management of COVID-19 waste disposal.	16 kg.	None.
2.	24/05/2020	01	03	69	43 kg		43 kg	None.
3.	25/05/2020	01	03	69	52 kg		52 kg	None.
4.	26/05/2020	01	03	70	67 kg		67 kg	None.
5.	27/05/2020	01	03	76	87 kg		87 kg	None.
6.	28/05/2020	01	03	80	20 kg		20 kg	None.
7.	29/05/2020	01	03	80	14.5 kg		14.5 kg	None.

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8.	30/05/2020	01	03	80	12 kg	The state does not have a dedicated CBWTF. Therefore, the SPCB has authorized District Hospitals, STNM Multispecialty and Manipal Central Referral Hospital for management of COVID-19 waste disposal	12 kg	None.
9.	31/05/2020	01	03	80	21 kg		21 kg	None.
10.	01/06/2020	01	03	70	10 kg.		10 kg.	None.
11.	02/06/2020	01	03	76	10 kg.		10 kg.	None.
12.	03/06/2020	01	03	80	08 kg		08 kg	None.
13.	04/06/2020	01	03	82	11 kg		11 kg	None.
14.	05/06/2020	01	03	82	28 kg		28 kg	None.
15.	06/06/2020	01	03	82	26 kg.		26 kg.	None.
16.	07/06/2020	01	03	82	28.5 kg		28.5 kg	None.
17.	08/06/2020	01	03	82	13.5 kg		13.5 kg	None.
18.	09/06/2020	01	03	82	41 kg		41 kg	None.
19.	10/06/2020	01	03	82	35 kg		35 kg	None.

**Table 2: Quantum of waste Generation from Quarantine Facility for the month of May and June 2020**

District	East			West			North			South			Weekly total
	No. of Quarantine centers.	General Solid Waste	Biomedical Waste	No. of Quarantine centers	General Solid Waste	Biomedical Waste	No. of Quarantine centers	General Solid Waste	Biomedical Waste	No. of Quarantine centers	General Solid Waste	Biomedical Waste	
7 <sup>th</sup> May - 14 <sup>th</sup> May 2020	23	606 kg	99 kg	22	386.72 kg	91.509 kg	07	37.5 kg	3.31 kg	07	165 kg	41.25 kg	Solid Waste=1,195.22 kg BMW= 235.069
15 <sup>th</sup> May - 21 <sup>st</sup> May 2020	32	37 kg	6 kg	23	566.2 kg	139.26 kg	07	54.5 kg	3 kg.	07	130.5kg	33.8 kg.	Solid Waste=788.2 BMW=182.06
22 <sup>nd</sup> May - 31 <sup>st</sup> May 2020	38	156 kg	40 kg	27	1108 kg	163.109 kg	07	58.55 kg.	9.02 kg	08	150 kg	101.6 kg	Solid Waste=1472.55 BMW=313.729 kg
01 <sup>st</sup> June - 10 <sup>th</sup> June 2020	39	200 kg	76.5 kg	19	1025.6 kg	689.9135 kg	07	11.26 kg	0.55 kg.	12	149 kg	173.82 kg	Solid Waste=1385.86 kg BMW=940.7835 kg.
<b>Total</b>	-	999 kg	221.5 kg	-	3086.52 kg	393.978 kg.	-	161.81	15.88 kg	-	445.5	176.65 kg.	Solid Waste=3455.97 kg. BMW=730.858

<b>Total General Solid Waste</b>	<b>4841.83 kg.</b>
<b>Total Biomedical Waste</b>	<b>1671.6415 kg.</b>

**Solid Waste = Collected and disposed by Urban Local bodies.**

**BMW= Incineration/ Deep Burial Pit.**

In addition to the above mentioned responsibilities the SPCB-Sikkim has also been conducting its normal activities and duties as usual. The State Pollution Control Board Sikkim has been conducting ambient air quality monitoring under the National Ambient Air Monitoring Programme in eight stations in the state of Sikkim. As per the analysis conducted, the ambient air quality in the state has been well within the permissible limits as per the provisions of the Air (Prevention and Control of Pollution) Act, 1981. Despite the lockdown, monitoring of Air and water quality is being conducted by the Board as per directives of the CPCB. Air quality is categorized into various indices such as good, satisfactory, moderate, poor, very poor & severe. As per the comparative analysis of the data generated for the average air quality index of March, April & May 2020, the state is well within the permissible limits and improvement has been observed after the implementation of the lockdown. The restriction in vehicular movement in addition to closure of all construction activities is likely to have contributed to the decrease in air pollution levels in the 1<sup>st</sup> and 2<sup>nd</sup> phase of the lockdown. However during the 3<sup>rd</sup> phase of lockdown in which vehicular movement was allowed along with transportation of construction material the air pollution levels has shown a slight increase although the values are within the permissible limits. Ravangla is the only station that has shown gradual decrease in the air quality pollution index which may be due to the fact that it receives more rainfall during the South West Monsoon season.

#### **Average Air Quality Index, 2020**

Sl. No.	Station	March 2020	April 2020	May 2020
1.	Deorali, Gangtok	60 (Satisfactory)	21 (Good)	38(Good)
2.	Rangpo	62(Satisfactory)	38 (Good)	38 (Good)
3.	Singtam	53(Satisfactory)	32(Good)	31(Good)
4.	Namchi	34 (Good)	10(Good)	24(Good)
5.	Ravangla	26 (Good)	25(Good)	15(Good)
6.	Mangan	33(Good)	13(Good)	20(Good)
7.	Chungthang	23(Good)	10(Good)	17(Good)
8.	Pelling	27(Good)	9(Good)	14(Good)

#### **Air Quality Index Impacts**

1.	<b>0-50 (Good)</b>	Minimal Impact
2.	<b>51 -100 (Satisfactory)</b>	Minor Breathing discomfort to sensitive people
3.	<b>101-200 (Moderate)</b>	Breathing discomfort to people with lung, heart disease, children and older adults
4.	<b>201-300 (Poor)</b>	Breathing discomfort to people on prolonged exposure
5.	<b>301-400 (Very poor)</b>	Respiratory illness to the people on prolonged exposure
6.	<b>&gt;401</b>	Respiratory effects on even healthy people

Similarly, water Quality Monitoring has also been conducted and reports are within permissible limits. The complete data has also been uploaded in ENVIS Centre, Gangtok portal.

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#### **Source**

**State Pollution Control Board Sikkim,  
Forest and Environment Department,  
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