

Acknowledgement

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List of Abbreviations

1.	NEC	National Environment Commission
2.	ETP	Effluent Treatment Plant
3.	sq. ft	Square feet
4.	PE	Poly-ethylene
5.	KLD	Kilo-litre per day
6.	FRPL	Fibreglass Reinforcement Plastic
7.	RCC	Reinforced Cement Concrete
8.	HDPE	High Density Polyethylene
9.	mg/L	Milligram per litre
10	KL	Kilolitre
11	AC	Alternating Current
12	m ³ /day	Cubic metre per day
13	V	Volt
14	Hz	Hertz
15	min	Minutes
16	HP	Horse Power
17	m	Metre
18	CGI	Corrugated Galvanised Iron
19	ml	Millilitre
20	mg/l	Milligram per litre

1. Introduction

Under the Environmental Assessment Act 2000 and the Regulation for the Environmental Clearance of Projects 2002, it is mandatory for all industries which generate effluents to comply with the Environmental Discharge Standards 2010.

The National Environment Commission's (NEC) objective is to effectively enforce the Environmental Discharge Standards in industries including the automobile sector. In particular, effluents discharged from vehicle wash facilities have remained weak, despite the ever increasing number of vehicles in the country. Currently, most of these facilities are located in Thimphu.

As per the survey conducted by NEC on 20th April 2012, there are 20 semi-automated vehicle wash facilities in the Olarongchu automobile workshop area. All these car wash facilities are integrated with existing automobile workshops. Most of these facilities have no effective Effluent Treatment Plant (ETP). Nonetheless, all these car wash units claim that their waste water is channeled into an ETP, a small plant, which is non-functional at Olarongchu automobile workshop. At present, the water used for washing vehicles is not recycled.

Further, there is a total lack of car/vehicle washing facilities in almost all the Dzongkhags except in the *Thromdes*. Some manual washing facilities either without or non-functional ETP exist in some *Thromdes*. There is an urgent need for establishment of ETP and additional facilities in *Thromdes*, in particular, for heavy vehicles.

Despite the large number of car wash facilities in Thimphu, many vehicles are washed in streams and rivers, a practice prevalent across the country. This practice contaminates the water bodies. As per the Waste Prevention and Management Act 2009, washing of vehicles in streams and rivers are prohibited. Therefore, it is essential to facilitate establishment of vehicle wash facilities in various locations across the country.

This proposal contains guidelines and information on types of light and heavy vehicle washing facilities that can be established depending on locations and feasibilities with various options.

2. Environmental concerns

Vehicle washing, in simple terms, involves cleaning the exterior and in some cases, the interior of motor vehicles. Currently, most of the vehicles are washed unlawfully either at home or in rivers and streams, while some do wash their cars at Olarongchu workshop area. Almost all trucks are washed in streams and rivers. The contamination of water bodies by untreated car wash effluents is a prominent and serious environmental hazard. The wastewater may include high levels of oil and grease, silt and unacceptable levels of acidity or alkalinity. The accumulated sediments or sludge may contain heavy metals such as chromium, lead, zinc and

nickel. Therefore, to avoid contamination of receiving water bodies, there is an urgent need for establishment of commercial washing facilities across the country to safeguard the environment.

Effluent (soap and dirty water) from vehicles washed in a modern commercial facility is treated by the ETP before it is released into the surrounding environment. Generally, a conventional vehicle wash uses more soap and water but now there are environment-friendly modern vehicle washing techniques available. This modern technology ensures a proper water recycling system followed by an advanced water treatment methods including biodegradable washing soap.

In practice, there are two kinds of vehicle washing facilities:

- i) An integrated service centre, and
- ii) Standalone washing facility.

An integrated washing facility has provisions for both vehicle washing and a servicing centre, whereas in a standalone washing facility, only vehicle washing is carried out. Therefore, an integrated washing facility can cause more pollution as compared to a standalone facility, due to spillage of grease, spent oil, radiator fluid, battery fluids, engine oil, and coolant during servicing.

3. Recommendations

3.1 General guidelines

Site selection criteria for establishment of vehicle wash facility

The following criteria must be enforced for selection of site for setting-up a vehicle wash facility:

- a) The site must be located at least 100 feet away from any water body.
- b) The site selected must have sufficient area for setting up the washing facility, parking, and construction of ETP.
- c) The site must be located at least 50 feet from any residential area, hospital, school and commercial area.

3.2 Minimum general standards for establishment of vehicle wash facility

The following are the minimum general standards:

- a) The entire vehicle wash facility must be paved with concrete to avoid soil and ground water contamination.
- b) The vehicle wash facility must be roofed with CGI to prevent rain from entering the facility.
- c) Walls must be built on three sides of the vehicle wash area, with a rounded curb or a drain at the entrance to prevent effluent flowing out into the surrounding areas and also storm water entering into the facility.
- d) A drainage system must be built channeling all wastewater into the ETP.
- e) Wastewater treatment – ETP – must be built to treat all effluent generated from the vehicle wash, before releasing it into the receiving environment. *The minimum treatment facility of an ETP is given in section 4.1.1 Option 1: Minimum Criteria for Wastewater Treatment.*
- f) Water used for washing the vehicle should be recycled, wherever feasible and where there is scarcity of water. *The treatment facility of an ETP for recycling of wastewater is given in section 4.1.2: Option 2 and 4.1.3: Option 3 respectively.*
- g) Settled solids or sludge from the ETP must be removed regularly to avoid overflowing or clogging of drains.
- h) Minimize use of water by ensuring that the water is not running when not in use, for instance while applying shampoo and detergents, etc.
- i) The facility must be strictly used for washing the vehicles only.
- j) The facility must have designated area for storage of waste oil, coolant, grease, lubricants, ETP sludge etc., in case of integrated washing facility.
- k) Engine oil, brake oil, coolant must not be allowed to drain into an ETP, in case of integrated washing facility.
- l) The truck and bus wash facility may include construction of a ramp as indicated in the drawing attached as *Annexure A*. Other equipment includes, but limited to an air compressor, servicing machine, and water pump.
- m) ETP flow diagram must be displayed at the facility including details of capacity and type of treatment.
- n) Use of a steamer for car washing should be explored (*Refer section 3.2*).
- o) Must maintain cleanliness within the facility at all times.
- p) The employee must be made aware of this guideline through conducting awareness program.
- q) Must adhere to the provisions under the Environmental Assessment Act 2000, National Environment Protection Act, 2007, Waste Prevention and Management Act, 2009, the Water Act of Bhutan, 2011, and any other relevant rules and regulations of the kingdom.

The following are the optional standard for establishment of vehicle wash facility:

- a) Use of solar water heating system for obtaining hot water to reduce the electricity cost.
- b) Rain water from the roof should be channeled to the water tank used for washing the vehicles.

3.3. Specific recommendations for establishment of vehicle wash facilities

There is a need to ensure that vehicle wash facilities are established in strategic locations in the country depending on the number of cars, trucks and buses that may avail the service. The NEC would like to recommend the following, as per the location:

3.3.1 Armed forces

- a) Armed forces must have vehicle washing facilities for light, medium and heavy vehicles. However, if there are vehicle wash facilities already in operation, then, the management must ensure that the effluents from these facilities are connected to an ETP (as stated in this report) and also that it conforms to the guideline.
- b) The Department of Industry, Ministry of Economic Affairs must ensure that all car wash facilities adhere to the guideline.
- c) The NECS shall be the overall monitoring authority.

3.3.2 Thimphu City Corporation

- a) The existing vehicle wash facilities in Olarongchu Automobile Workshop area (about 20 car wash facilities) must comply with the guideline
- b) Thimphu City Corporation should facilitate establishment of at least one truck washing facility in a strategic location
- c) Thimphu City Corporation must facilitate establishment of an automatic vehicle wash facility, if there are interested applicants, following the guideline
- d) The Department of Industry, Ministry of Economic Affairs must ensure that all car wash facilities adhere to the guideline.
- e) The NECS shall be the overall monitoring authority.

3.3.3 Dzongkhag Thromdes – Gelephu, Samdrup Jongkhar and Phuentsholing

- a) The existing car wash facility within the city corporations must ensure that they adhere to the guideline
- b) The city corporations must ensure that there is at least one car wash facility and also truck wash facility in a strategic location following the guideline
- c) The city corporations may facilitate an automatic car wash facility, if there are interested applicants, depending on the economic viability, in particular number and types of cars in the area
- d) The Department of Industry, Ministry of Economic Affairs must ensure that all car wash facilities adhere to the guideline

- e) The NECS shall be the overall monitoring authority.

3.3.4 Dzongkhags

- a) Dasho Dzongdags must facilitate that there is at least one car wash facility within the Dzongkhag to prevent washing of cars at home and also in the streams and rivers. In addition, the mobile car wash facility may be more practical and accessible.
- b) Dasho Dzongdags must facilitate that there is at least vehicle washing facility within the Dzongkhag to wash heavy vehicles such as trucks in a strategic location
- c) The Department of Industry, Ministry of Economic Affairs must ensure that all car wash facilities adhere to the guideline
- d) The District Environmental Officers and the NECS shall be the overall monitoring authorities.

3.3.5 Significant projects

- a) Large projects, in particular, hydropower projects and *Project Dantak*, must ensure that there is a car wash facility installed, if the commercially available facilities are not used.
- b) The Department of Industry, Ministry of Economic Affairs must ensure that all car wash facilities adhere to the guideline with respect to the industries and projects executed under the Ministry of Economic Affairs. Likewise, all the parent ministries of respective projects with such facilities shall ensure the effective implementation of such facilities.
- c) The District Environmental Officers and the NECS shall be the overall monitoring authorities.

4. Implementation Arrangement

1. All the Dzongkhag Thromdes and Dzongkhags must accord high priority for establishment of car wash facility, Truck and Bus washing facilities in their respective territories.
2. For Thimphu Thromde, there is an urgent need to establish an efficient ETP plant at Olarongchu Automobile Workshop in order to treat the waste water immediately to prevent the effluent discharged directly into the Olarongchu stream. The need for additional car washing facilities has to be studied immediately. Thimphu Thromde needs to identify locations for the establishment of Truck and Bus Washing facilities as per the guidelines and recommendations as proposed in this document.
3. All other Dzongkhag Thromdes (Phuentsholing, Gelephu and Samdrup Jongkhar) need to study and propose establishment of semi-automatic or automatic washing facilities for light and heavy vehicles, along with identified locations. It is mandatory to establish an ETP along with the washing facility.
4. Rest of the Dzongkhags with the support of Dzongkhag Municipalities should have either manual or semi-automatic light and heavy vehicle washing facilities connected to ETP. The mobile car washing facilities is also recommended. The Dzongkhags should propose the number and type of facilities required depending on the number of vehicles

and available locations.

5. A VVIP automatic car wash facility needs to be established at a suitable location.
6. To facilitate and expedite establishment of vehicle wash facilities, the government may consider provision of tax exemption for import of equipment which is environmental friendly technology. In view of the fact that some applicants have been forthcoming with their proposals to establish such facilities in Thimphu and even in Gelephu Thromdes, subsidies may not be necessary and it could have been economically viable business venture. However, in order to expedite the establishment of the facilities in all the Dzongkhags and Thromdes, the government may like to consider provision of subsidies (10% to 30%) or soft loan. The NEC would like to recommend provision of subsidy for establishment of ETP and a soft loan for washing facilities. This is suggested since the Waste Prevention and Management Act 2009 prohibits washing of cars in rivers, streams or in any water body to prevent pollution and that public should have an option already available for washing of cars where the effluent from these facilities are treated using the Effluent Treatment Plant as mandated by the NEC.
7. A mobile car washing facility, as proposed, may be encouraged wherever necessary.
8. Provision of tax incentives or subsidies may encourage private sector to establish vehicle wash facility within 10th Five Year Plan. If vehicle wash facilities are not established within the 10th Five Year Plan, then, some programs and activities may have to be included in the 11th Five Year Plan.
9. The Department of Industry, Ministry of Economic Affairs, as a designated Competent Authority, must ensure that all car/vehicle washing facilities adhere to the guidelines. Likewise, all the parent ministries of respective projects with such facilities shall ensure the effective implementation of such facilities.
10. The Dzongkhag Municipalities functioning under the Dzongkhag Administration will ensure the smooth functioning of such facilities in respective Dzongkhags.
11. The information on cost, equipment and design is only intended to help owners and operators of vehicle wash facilities to plan effectively. The proposed facilities are based on current market price in India except for the Steam Car Wash price made in South Korea and an automated car wash made in China. The Indian technology is recommended in view of the convenience for maintenance and lesser cost of transportation. However, the proponents can explore more sophisticated and even more costly equipment as per their interest and plans.
12. Wherever necessary and if private land is not available at desirable location, the government may lease the required area of land.