

**1. DETAILS OF NOISE MEASUREMENT AND ASSESSMENT OF EXISTING PLANTS AT SHA TIN WATER TREATMENT WORK**

**1.1 Details of Noise Measurement for existing plants and Projection of SPL at NSR**

1.1.1 Based on latest information from the project engineer, existing plants of the North Work of Sha Tin Water Treatment Work (Sha Tin WTW) would be remained in operation during this stage of improvement works.

1.1.2 The remaining plants of the North Work are listed below as **Table 1.1**.

**Table 1.1 Existing Plants of North Work to Be Remain in Operation**

ID	Plant
E1-E4	Sludge Tank Motor
E-5	Sludge Treatment House Ventilation Exhaust
E-7	Sludge Treatment House at Entrance Opening
E-8	North Pump Hall at Entrance Opening
E-9	Acceleration Tank Control Room at Entrance Opening
E-10-E15	Acceleration Tank Centre Motor
E-10-E15	Acceleration Tank Side Motor
E16	Chlorine House Ventilation Exhaust
E17	Chlorine House Battery House at Entrance Opening

1.1.3 Separated in-situ noise measurements were conducted at each of the identified plant for the estimation of SWL. As the type and size varies among these identified plants, the methodologies of assessing the noise impact of these plants are slightly different.

1.1.4 In general, for plants that the noise emitting part is distinct and small in size, the noise level are measured and assessed using the acoustic principle of point noise source; for plants that are grouped together or large in size, it assumes that the noise emitting area / opening to be a plain area noise source. Noise measurements are conducted at the worst location at the measurement surface, and SWL of the plain area is calculated for the projection of SPL at nearby NSRs.

1.1.5 Details about the measurement and assessment of each plant are explained below:

E1-E4 Sludge Tank Motor

1.1.6 The motor in the middle of the Sludge tanks are the only noise emission source of the sludge tank, the motors are small in size. It is assumed that the motor to be a point noise source. The SPL at the NSR is calculated by adding the correction of distance from the motor, with tonality correction applied based on measurement data. Photo of the motor is show below as **Fig 1**.

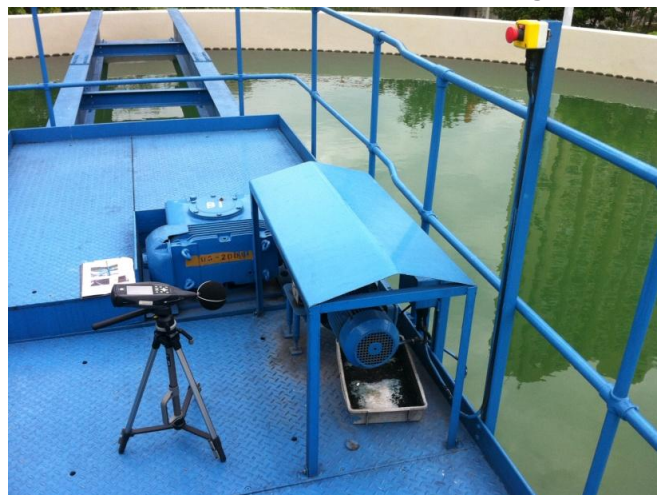


Fig. 1. Sludge Tank Motor

E-5 Sludge Treatment House Ventilation Exhaust

- 1.1.7 There is a row of ventilation louver located at the side of the sludge treatment house. It is assumed that the plain area of the ventilation louver to be an area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL of the louver was calculated. The SPL at NSRs are projected by correcting the distance attenuation from the louver to the NSRs, with tonality correction applied based on measurement data. Photo of the ventilation louver is shown as **Fig. 2**.



Fig. 2. Sludge Treatment House Ventilation

E-7 Sludge Treatment House at Entrance Opening

- 1.1.8 The Sludge Treatment House has been installed with various sludge treatment equipments. It is generally a concrete structure and the main entrance in front of it is the only opening and the noise emitting location. It is assumed that the main entrance opening of the Sludge Treatment House as a plain area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL of the opening was calculated. The SPL at NSRs are projected by correction the distance attenuation from the opening to the NSR, with correction of tonality based on measurement data. Photo of the sludge treatment house entrance opening is shown as **Fig. 3**.



Fig. 3. Sludge Treatment House Front Opening

E-8 North Pump Hall at Entrance Opening

- 1.1.9 The North Pump Hall is a concrete structure with various large water pumps and machineries installed. There are two openings at the North Pump Hall, which are the entrance in the front (as shown in **Fig. 4**) and the entrance at the back. The opening at the back is facing the natural slope

behind the Sha Tin WTW. Based on field observation, there will not be any line of sight from any of the NSRs nearby. It is assumed that the entrance of the North Pump Hall to be a plain area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL of the opening was calculated. The SPL at the NSRs are projected by applying the distance attenuation from the opening to the NSR, with correction of tonality based on measurement data.



Fig. 4. North Pump Hall

E-9 Acceleration Tank Control Room at Entrance Opening

1.1.10 Similar to the North Pump Hall, the Acceleration Tank Control Room is a concrete structure with various large water pumps and machineries installed. There are two openings at the North Pump Hall, which are the entrances in the front (as shown in **Fig. 5**) and the entrance at the back. The opening at the back is facing the natural slope behind the Sha Tin WTW. Based on field observation, there will not be any line of sight from any of the NSRs nearby. It is assumed that the entrance of the Acceleration Tank Control Room to be a plain area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL of the opening was calculated. The SPL at the NSRs are projected by applying the distance attenuation from the opening to the NSR, with correction of tonality based on measurement data.



Fig. 5. Acceleration Tank Control Room

E-10 -15 Acceleration Tank Centre Motor and Side motor

1.1.11 The noise sources of the acceleration tank are the two motors in each of the acceleration tanks, the middle motor stays in a constant location, while the side motor progress slowly near the edge of the tank. The noise emitting parts are small at both of the motors, separated noise measurements are conducted for both of the motor. As the side motor would move constantly while in operation, it is assumed to be a notional source, and while assessing the SPL at the NSR, the centre location of circle is assumed, which is the same location as the centre motor. Therefore the SWL of the two motors are summed up to represent the noise level of each of the Acceleration Tanks. The SPL at the NSRs are then projected by applying correction of distance attenuation and tonality. Photos of the motors are shown as **Fig. 6** and **Fig. 7**.



Fig. 6. Acceleration Tank middle motor



Fig. 7 Acceleration Tank side motor

E-16 Chlorine House Ventilation Exhaust

1.1.12 The dominance noise sources of the Chlorine House are the two ventilation louvers, with minor noise emission from the main entrance, it is assumed that the area of the ventilation louvers to be a plain area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL was calculated. The SPL at NSRs are projected by correcting the distance attenuation from the louver to the NSRs, with tonality correction applied based on measurement data. Photo of the ventilation louvers is shown as **Fig. 8**.



Fig. 8. Chlorine House (Ventilation)

E-16 Chlorine House Battery House at Entrance Opening

1.1.13 The Chlorine House has installed a battery house, which was identified as a noise source. The noise from the battery house is mainly emitted from its entrance and the louver next to the entrance. It is assumed that the entrance to be a plain area noise source. Noise measurement was conducted at the worst location on the measurement surface, and the SWL was calculated. The SPL at the NSRs are

projected by applying the correction of distance attenuation and tonality based on measurement data. Photo of the Chlorine House Battery House is shown as **Fig. 9**.



Fig. 9. Chlorine House (Battery House)