

## 15 IMPLEMENTATION SCHEDULE OF THE PROPOSED MITIGATION MEASURES

**Table 15.1 Implementation Schedule for Air Quality Impact**

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S3.29	<p>Dust mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation should be incorporated to control dust emission from the site. Control measures relevant to this Project are listed below:</p> <ul style="list-style-type: none"> <li>• Skip hoist for material transport should be totally enclosed by impervious sheeting;</li> <li>• Vehicle washing facilities should be provided at every vehicle exit point;</li> <li>• The area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcore;</li> <li>• Where a site boundary adjoins a road, streets or other areas accessible to the public, hoarding of not less than 2.4 m high from ground level should be provided along the entire length except for a site entrance or exit;</li> <li>• Use of regular watering, with complete coverage, to reduce dust emissions from exposed site surfaces and unpaved roads, particularly during dry weather;</li> <li>• Side enclosure and covering of any aggregate or dusty material storage piles to reduce emissions. Where this is not practicable owing to frequent usage, watering shall be applied to aggregate fines;</li> <li>• Open stockpiles shall be avoided or covered. Where possible, prevent placing dusty material storage piles near ASRs;</li> </ul>	Work sites / During the construction period	Contractor		√			EIAO-TM and Air Pollution Control (Construction Dust) Regulation

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	<ul style="list-style-type: none"> <li>• Tarpaulin covering of all dusty vehicle loads transported to, from and between site locations;</li> <li>• Imposition of speed controls for vehicles on unpaved site roads. Ten kilometers per hour is the recommended limit;</li> <li>• Every stock of more than 20 bags of cement should be covered entirely by impervious sheeting placed in an area sheltered on the top and the 3 sides;</li> <li>• Every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites; and</li> <li>• Instigation of an environmental monitoring and auditing program to monitor the construction process in order to enforce controls and modify method of work if dusty conditions arise.</li> </ul>							

# All recommendations and requirements resulted during the course of EIA/EA Process, including ACE and / or accepted public comment to the proposed project.

\* Des - Design, C - Construction, O – Operation, and Dec - Decommissioning

**Table 15.2 Implementation Schedule for Noise Impact**

EIA Ref #	Environmental Protection Measures/Mitigation Measures	Location/ Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S4.48 – S4.50	Use of quiet PME	Work sites / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance
S4.51	<p><i>Good Site Practice</i></p> <ul style="list-style-type: none"> <li>• Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program;</li> <li>• Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program;</li> <li>• Mobile plant, if any, should be sited as far from NSRs as possible;</li> <li>• Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;</li> <li>• Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and</li> <li>• Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.</li> </ul>	Work sites / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance
S4.56 & S13	Noise monitoring should be carried out to ensure that noise mitigation measures would be properly implemented. Details of the monitoring requirements are specified in the EM&A Manual.	Barrack / During the construction period	Contractor		√			EIAO-TM and Noise Control Ordinance

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**Table 15.3 Implementation Schedule for Water Quality Impact**

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S5.212	The practices outlined in ProPECC PN 1/94 Construction Site Drainage should be adopted. It is recommended to install perimeter channels in the works areas to intercept runoff at site boundary prior to the commencement of any earthwork. To prevent storm runoff from washing across exposed soil surfaces, intercepting channels should be provided. Drainage channels are also required to convey site runoff to sand/silt traps and oil interceptors. Provision of regular cleaning and maintenance can ensure the normal operation of these facilities throughout the construction period. Any practical options for the diversion and re-alignment of drainage should comply with both engineering and environmental requirements in order to ensure adequate hydraulic capacity of all drains.	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.213	There is a need to apply to EPD for a discharge licence under the WPCO for discharging effluent from the construction site. The discharge quality is required to meet the requirements specified in the discharge licence. All the runoff and wastewater generated from the works areas should be treated so that it satisfies all the standards listed in the TM-DSS. Reuse and recycling of the treated effluent can minimise water consumption and reduce the effluent discharge volume. The beneficial uses of the treated effluent may include dust suppression, wheel washing and general cleaning. If monitoring of the treated effluent quality from the works areas is required during the construction phase of the Project, the monitoring should be carried out in accordance with the WPCO license which is under the ambit of regional office (RO) of EPD.	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.214	The construction programme should be properly planned to minimise soil excavation, if any, in rainy seasons. This prevents soil erosion from exposed soil surfaces. Any	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance

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	exposed soil surfaces should also be properly protected to minimise dust emission. In areas where a large amount of exposed soils exist, earth bunds or sand bags should be provided. Exposed stockpiles should be covered with tarpaulin or impervious sheets at all times. The stockpiles of materials should be placed at locations away from any stream courses so as to avoid releasing materials into the water bodies. Final surfaces of earthworks should be compacted and protected by permanent work. It is suggested that haul roads should be paved with concrete and the temporary access roads protected using crushed stone or gravel, wherever practicable. Wheel washing facilities should be provided at all site exits to ensure that earth, mud and debris would not be carried out of the works areas by vehicles.							
S5.215	Good site practices should be adopted to clean the rubbish and litter on the construction sites so as to prevent the rubbish and litter from spreading from the site area. It is recommended to clean the construction sites on a regular basis.	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.216	The presence of construction workers generates sewage. It is recommended to provide sufficient chemical toilets in the works areas. The toilet facilities should be more than 30 m from any watercourse. A licensed waste collector should be deployed to clean the chemical toilets on a regular basis. The construction workers can also make use of the existing toilet facilities within the SCISTW as necessary.	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.217	Notices should be posted at conspicuous locations to remind the workers not to discharge any sewage or wastewater into the nearby environment during the construction phase of the project. Regular environmental audit on the construction site can provide an effective control of any malpractices and can achieve continual improvement of environmental performance on site. It is	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance

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	anticipated that sewage generation during the construction phase of the project would not cause water pollution problem after undertaking all required measures.							
S5.218	Contractor must register as a chemical waste producer if chemical wastes would be produced from the construction activities. The Waste Disposal Ordinance (Cap 354) and its subsidiary regulations in particular the Waste Disposal (Chemical Waste) (General) Regulation should be observed and complied with for control of chemical wastes.	Work site / During the construction period	Contractor		√			EIAO-TM, Waste Disposal Ordinance and Water Pollution Control Ordinance
S5.219	Any service shop and maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should only be undertaken within the areas appropriately equipped to control these discharges.	Work site / During the construction period	Contractor		√			EIAO-TM, Waste Disposal Ordinance and Water Pollution Control Ordinance
S5.220	Disposal of chemical wastes should be carried out in compliance with the Waste Disposal Ordinance. The Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published under the Waste Disposal Ordinance details the requirements to deal with chemical wastes. General requirements are given as follows: <ul style="list-style-type: none"> <li>• Suitable containers should be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport.</li> <li>• Chemical waste containers should be suitably labeled, to notify and warn the personnel who are handling the wastes, to avoid accidents.</li> <li>• Storage area should be selected at a safe location on site and adequate space should be allocated to the storage area.</li> </ul>	Work site / During the construction period	Contractor		√			EIAO-TM and Water Pollution Control Ordinance
S5.221	An Effluent quality from the SCISTW will be governed by the Water Pollution Control Ordinance and the associated discharge licence conditions. The dosing system is	SCISTW / During the operational phase	DSD	√		√		EIAO-TM and Water Pollution Control Ordinance

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	designed to allow adjustment for compliance of the effluent standards as well as minimization of the chlorine dosage, thus, the potential generation of chlorination by-products.							
S5.223	Failure of dechlorination could be caused by the malfunction of the pumping system or power failure at the dechlorination unit. In case of power outage, the uninterruptible power supply (UPS) system will switch the power supply of the sodium bisulphite dosing pump to a backup battery almost instantaneously, allowing continuous dosage of sodium bisulphite for at least half an hour so that sufficient time can be provided for shutting down the chlorination plant to avoid the possibility of discharge of chlorinated effluent.	SCISTW / During the operational phase	DSD			√		EIAO-TM and Water Pollution Control Ordinance
S5.224	In the event of chlorination plant failure or shutdown of the chlorination plant occurs, the Tsuen Wan beaches and the secondary contact zones in the coastal areas of Tsuen Wan should be closed. It is recommended that relevant government departments including EPD and LCSD shall be informed by DSD as soon as possible of any emergency discharge so that appropriate actions can be taken to prevent any bathing or water sports activities to be carried out. The Plant operators should maintain good communications with various concerned parties including AFCD and WSD. A list of address, email address, phone and fax number of key persons in relevant departments responsible for action should be made available to the plant operators. Water quality monitoring should be carried out to quantify the water quality impacts and to determine when the normal water quality conditions are restored.	SCISTW / During the operational phase	DSD, EPD, LCSD			√		EIAO-TM and Water Pollution Control Ordinance
S5.225	The response procedure stated in EM&A Manual should be followed in case of chlorination / dechlorination plant failure.	SCISTW / During the operational phase	DSD			√		EIAO-TM and Water Pollution Control Ordinance

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**Table 15.4 Implementation Schedule for Waste Management Implications**

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S10.21	<p><i>Good Site Practices</i> Recommendations for good site practices during the construction activities include:</p> <ul style="list-style-type: none"> <li>• Nomination of an approved person, such as a site manager, to be responsible for good site practices, arrangements for collection and effective disposal to an appropriate facility, of all wastes generated at the site</li> <li>• Training of site personnel in proper waste management and chemical handling procedures</li> <li>• Provision of sufficient waste disposal points and regular collection of waste</li> <li>• Appropriate measures to minimise windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers</li> <li>• Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.</li> <li>• Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility..</li> </ul>	Work site / During the construction period	Contractor		√			Waste Disposal Ordinance (Cap.54) ETWB TCW No. 19/2005
S10.22	<p><i>Waste Reduction Measures</i> Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:</p> <ul style="list-style-type: none"> <li>• Segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal</li> <li>• Encourage collection of aluminium cans by providing</li> </ul>	Work site / During planning & design stage, and construction stage	Contractor	√	√			



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	<p>separate labelled bins to enable this waste to be segregated from other general refuse generated by the workforce</p> <ul style="list-style-type: none"> <li>• Proper storage and site practices to minimise the potential for damage or contamination of construction materials</li> <li>• Plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.</li> <li>• A recording system for the amount of wastes generated, recycled and disposed (including disposal sites) should be proposed.</li> <li>• Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedures, including waste reduction, reuse and recycle.</li> </ul>							
S10.24	<p><i>General Refuse</i></p> <p>General refuse should be stored in enclosed bins or compaction units separate from C&amp;D material. A reputable waste collector should be employed by the contractor to remove general refuse from the site, separately from C&amp;D material. Preferably an enclosed and covered area should be provided to reduce the occurrence of 'wind blown' light material.</p>	Work site / During the construction period	Contractor		√			Public Health and Municipal Services Ordinance (Cap. 132)
S10.25	<p><i>Construction and Demolition Material</i></p> <p>In order to minimise impacts resulting from collection and transportation of C&amp;D material for off-site disposal, the excavated material generated from excavation works for the proposed chlorination plant, dechlorination plant, day tank and pipe trenches should be reused on-site as backfilling material as far as practicable. The surplus</p>	Work site / During design stage & construction period	Contractor	√	√			ETWB TCW No. 33/2002 ETWB TCW No. 19/2005

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	excavated material should be disposed of at the designated public fill reception facility, as agreed with the Secretary of the Public Fill Committee, for other beneficial uses. C&D waste generated from site clearance and dismantling of formwork would require disposal to the designated landfill site. In order to monitor the disposal of C&D material at the public fill reception facility and landfill and to control fly-tipping, a trip-ticket system should be included. One may make reference to ETWB TCW No. 31/2004 for details.							
S10.26	<p><i>Chemical Waste</i></p> <p>If chemical wastes are produced at the construction site, the Contractor would be required to register with the EPD as a chemical waste producer and to follow the guidelines stated in the <i>Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes</i>. Good quality containers compatible with the chemical wastes should be used, and incompatible chemicals should be stored separately. Appropriate labels should be securely attached on each chemical waste container indicating the corresponding chemical characteristics of the chemical waste, such as explosive, flammable, oxidizing, irritant, toxic, harmful, corrosive, etc. The Contractor shall use a licensed collector to transport and dispose of the chemical wastes, to either the approved Chemical Waste Treatment Centre, or another licensed facility, in accordance with the Waste Disposal (Chemical Waste) (General) Regulation.</p>	Work site / During the construction period	Contractor		√			Waste Disposal (Chemical Waste) (General) Regulation

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**Table 15.5 Implementation Schedule for Hazard to Life Impact**

EIA Ref #	Environmental Protection Measures / Mitigation Measures	Location / Timing	Implementation Agent	Implementation Stages*				Relevant Legislation and Guidelines
				Des	C	O	Dec	
S11.9	<p><u>Provision of Bund Wall for Chlorination and Dechlorination Facility</u></p> <p>Bund wall of 2m high will be provided for chlorination facility, whereas bund wall of 1.5m high will be provided for dechlorination facility.</p>	SCISTW / During the design period	DSD		√			
S11.73	<p><u>Special Chemical Supply Contract Arrangement</u></p> <p>A separate supply contract will be awarded for each of the three chemicals (sodium hypochlorite, sodium bisulphite and ferric chloride solutions).</p> <p>Chemical supplier will be required to provide dedicated transport specifically used for delivering the chemical to be supplied, and the road tankers will need to be registered with SCISTW. In addition, the supply contract for sodium hypochlorite will specify that the delivery barge provided will be restricted for delivering sodium hypochlorite directly and exclusively from the supplier's production plant to SCISTW during the contract period. The delivery barge will not be allowed to provide other services, such as carrying other chemical or carrying chemicals to other facilities other than SCISTW.</p>	<p>N/A (Chemical Supply Contract) / During operation period</p> <p>N/A (Chemical Supply) / During operation period</p>	<p>DSD</p> <p>Chemical supplier</p>			√		
S11.74	<p><u>Separation of Chemical Storage Area</u></p> <p>Locate sodium hypochlorite and ferric chloride tank farms in separate areas of SCISTW. After the completion of Stage 2A construction works, the area separating the two tank</p>	SCISTW / During the design period	DSD	√				

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	farms will be occupied by existing Chemical Dosing Building and HATS 2A permanent structures such as pumping station and sedimentation tanks. Before the Stage 2A permanent structures are built, a temporary screening structure made of water-filled barriers will be erected between the two tank farms.							
S11.76 – S11.78	<p><u>Protection and Separation of Chemical Delivery Pipelines</u></p> <p>Each chemical delivery pipeline will be installed in designated and separate service duct or pipe trench to provide additional protection. There will be no pipe crossings among the pipeline systems of sodium hypochlorite, sodium bisulphite, and ferric chloride.</p> <p>Install a vibration sensing system at the ferric chloride and sodium hypochlorite tank farm to enable shut down of the chemical pumping system (at storage tank or sodium hypochlorite delivery barge) whenever excessive vibrations are detected, in order to minimize the amount of chemical that can escape in the event of pipeline failure due to excessive vibrations.</p> <p>Wrap the pipe trench accommodating sodium hypochlorite feeding pipelines by heavy-duty impervious membrane to provide an additional barrier to migration of the leaked sodium hypochlorite solution. Furthermore, a road kerb is proposed to be constructed near the section of hypochlorite pipeline near the barge unloading facility and a U-channel is proposed at the foot of the concrete barrier to facilitate surface drainage into the sea.</p>	<p>SCISTW / During the design period</p> <p>SCISTW / During the design period</p> <p>SCISTW / During the design period</p>	<p>DSD</p> <p>DSD</p> <p>DSD</p>	<p>√</p> <p>√</p> <p>√</p>				

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S11.80 – S11.81	<u>Dedicated Chemical Delivery Route and Road Signs</u>							
	Specific road tanker transport route will be assigned to each chemical.	SCISTW / During operation period	DSD and chemical supplier			√		
	Provide road signs on service road indicating the route to specific chemical storage area.	SCISTW / During operation period	DSD			√		
S11.82	<u>Security of Chemical Loading Points</u>							
	Chemical delivery staff will need to register with SCISTW staff upon entering the site. Loading points for ferric chloride, sodium hypochlorite and sodium bisulphite will be secured by locks and the keys will be kept by SCISTW staff. The chemical unloading operation cannot start without presence of SCISTW staff to open the locks.	SCISTW / During operation period	DSD and chemical supplier			√		
S11.83 – S11.85	<u>Unique Colour and Size of Pipelines and Hose Coupling for Different Chemicals</u>							
	Delivery pipelines for different chemicals will be in different colours and different sizes.	SCISTW / During design period	DSD	√				
	There will be specific hose connection design for each chemical, the type, size and colour of coupling will be specific for each chemical – for loading point at SCISTW, the coupling size, type and colour of the loading point of each tank farm will be unique (different from the other two tank farms).	SCISTW / During design period	DSD	√				

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	For the loading hose, the supplier will be required to carry the loading hose specifically used for the delivery to SCISTW in each chemical delivery. The loading hose should be clearly coloured and labelled with the name of chemical to be delivered.	SCISTW / During operation period	Chemical supplier			√		
S11.86	<u>Clear Labelling of Chemicals-related Equipments</u>  Provide clear and sufficient signage / labels to indicate the identity (i.e. for which chemical) of each tank farm and associated equipment including pipelines, loading points and loading hoses	SCISTW / During operation period	DSD			√		
S11.87	<u>Ensuring Quality of Chemical Supplier</u>  <ul style="list-style-type: none"> <li>Only appoint chemical suppliers with satisfactory quality system</li> <li>Request the chemical supplier to employ an independent checker to audit the quality and safety management system of the supplier</li> <li>The chemical supplied to SCISTW can only be produced in designated chemical production plants and delivered directly from designated locations. This measure will be included in the chemical supply contract</li> </ul>	N/A (Chemical supplier quality) / During operation period	DSD / Chemical supplier			√		
S11.88 – S11.93	<u>Procedural Control of Chemical Unloading Operation</u>  Develop clear procedural controls for barge / road tanker filling and unloading operation.  SCISTW staff will be present at the tank area to receive the barge / road tanker, check barge / road tanker labels, check the transport documents carried by the barge crew / road	N/A / During operation period  SCISTW / During operation period	DSD  DSD and Chemical Supplier			√  √		

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	<p>tanker driver, check type, size and colour of coupling and hose coupler, conduct chemical analysis to check the identity of delivered chemical and only then authorize the driver to unload the content.</p> <p>Chemical supplier needs to fax or electronically transmit copies of delivery bills-of-lading information and barge crew / road tanker driver identification to SCISTW prior to delivery barge / road tanker arriving on-site. Such information will be in compliance with the supplier's independently accredited quality assurance system (to ISO:9000 or equivalent).</p> <p>Conduct chemical analysis to determine the identity (not only pH) of the chemical. The analysis needs to be conducted by SCISTW staff or independent checker before the chemical is authorized to be unloaded to the tank farm.</p> <p>If the coupling of hose connected to the barge / road tanker is found to be unmatched with the coupling of loading point of tank farm, chemical unloading operation must not proceed and the situation must be reported to the SCISTW management for follow-up actions.</p> <p>Chain-of-custody documentation system will be used to ensure both the supplier (factory) and SCISTW staff have checked the chemical identity and the consistency of the chemical analysis result.</p>	<p>Chemical Supply Factory and SCISTW / During operation period</p> <p>SCISTW / During operation period</p> <p>SCISTW / During operation period</p> <p>Chemical Supply Factory and SCISTW / During operation period</p>	<p>Chemical Supplier</p> <p>DSD or Independent Checker</p> <p>DSD and Chemical Supplier</p> <p>DSD and Chemical Supplier</p>			<p>√</p> <p>√</p> <p>√</p> <p>√</p>		
S11.94 – S11.96	<p><u>Measures to Identify and Stop Chemical Unloading in Error Event</u></p> <p>Chlorine gas detectors will be installed near the tank vents for each ferric chloride and sodium hypochlorite storage tank, whereas sulphur dioxide gas detectors will be installed</p>	<p>SCISTW / During operation stage</p>	<p>DSD</p>			<p>√</p>		

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	<p>near the tank vents for each ferric chloride and sodium bisulphite tank. Alarm will annunciate at the tank farm area and in the central control centre.</p> <p>Emergency shutdown valve will be installed on the inlet of the tank farms, to stop chemical unloading to the storage tank when the valve is closed. Closure of the emergency shutdown valve can be initiated by the activation of the alarm in the tank farm area or central control centre.</p> <p>Also, CCTV system will be installed to monitor the situation at the chemical tank farm.</p>							
S11.97	<p><u>Special Arrangement of SCISTW Public Event</u></p> <p>Public evens might sometimes be held in SCISTW which allow access of public to the plant facilities. As a precautionary measure, chemical delivery operation will be suspended on days of SCISTW public event. Also, public members visiting the SCISTW will be guided by DSD staff and will not be allowed to visit the area near the chemical storage locations in SCISTW.</p>	SCISTW / During operation stage	DSD		√			
S11.179	<p>Increase the height to 2.3m of a (12m + 10m =) 22m long section of the bund wall around the northernmost storage tank (which is the tank closest to the hypochlorite pipeline to the west).</p> <p>Restrict storage of ferric chloride storage solution in Tank A to no more than 350m<sup>3</sup>, which means that the height of the liquid in the tank will be no higher than about 6.96m.</p>	<p>SCISTW / During design stage</p> <p>SCISTW / During operation stage</p>	<p>DSD</p> <p>DSD</p>	√		√		

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